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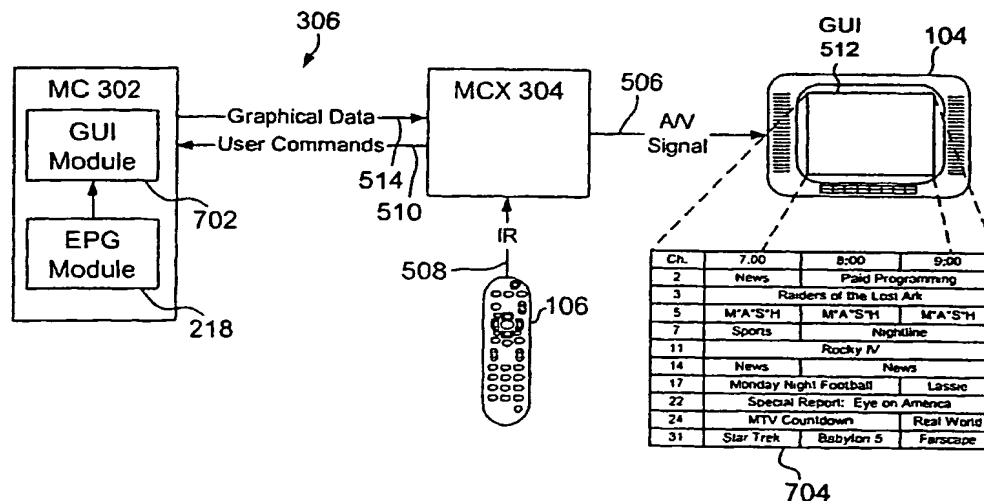
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(54) Title: FOCUSED NAVIGATION INTERFACE FOR A HOME MEDIA CENTER WITH MULTIPLE TELEVISION SUPPORT



(57) Abstract: Within a media center (302), a user interface module (702) generates graphical data (514) representing a user interface (512). A network interface (406) sends the graphical data (514) via a home network (306) to a media center extension (304), where a display interface (206) renders the graphical data (514) into the user interface (512) on a television (104). In one configuration, the user interface (512) includes a focus area (902) intersected by a first axis, as well as a first sequence (900) of cards (800) displayed along the first axis, each card (800) graphically representing an available option, one card (800) being displayable within the focus area (902). The first sequence (900) of cards (800) is to be scrolled along the first axis in response to an initiating action to progressively change the card (800) within the focus area (902). Furthermore, the scrolling of cards (800) is to be halted in response to a terminating action to show a selected card (800) from the first sequence (900) within the focus area (902).

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# FOCUSED NAVIGATION INTERFACE FOR A HOME MEDIA CENTER WITH MULTIPLE TELEVISION SUPPORT

## BACKGROUND

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### FIELD OF THE INVENTION

The present invention relates generally to home entertainment systems. More specifically, the present invention relates to a home media center and extension devices for supporting multiple televisions within a household.

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### DESCRIPTION OF RELATED BACKGROUND ART

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Interactive television (ITV) continues to increase in popularity. Many cable and satellite television subscribers now enjoy access to e-mail, instant messaging, web browsing, personal video recording, and the like, using a home television.

20

Unfortunately, conventional ITV systems require a separate set top box (STB) for each television for which interactivity is desired. This is problematic because STBs are expensive, and the average U.S. household has more than two televisions. Indeed, many households have four or more televisions, each of which would require an STB costing at least \$500. In general, neither subscribers nor cable or satellite operators are willing to pay thousands of dollars to enable ITV functionality on multiple televisions throughout the home.

### BRIEF DESCRIPTION OF THE DRAWINGS

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FIG. 1 is a block diagram of a system for distributing media signals to subscribers;

FIG. 2 is a block diagram of a set top box (STB);

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FIG. 3 is a block diagram of home entertainment system including a media center and a number of media center extensions (MCXs) for supporting multiple televisions within a household;

FIG. 4 is a block diagram of a home entertainment system showing details of a media center and MCX;

FIG. 5 is a dataflow diagram of a home entertainment system according to an embodiment of the invention; and

FIG. 6 is a flowchart of a method performed by a home entertainment system for distributing media signals to multiple televisions;

FIG. 7 is a block diagram of a Graphical User Interface (GUI) module for generating a GUI on a display device attached to an MCX;

5 FIG. 8 is a block diagram of a plurality of cards;

FIG. 9 is a block diagram of a sequence of cards to be successively displayed within a focus area of a GUI;

FIG. 10 is a block diagram of a sequence of cards being displayed along an axis of a GUI;

10 FIG. 11 is a block diagram of a card including an alternative graphical image;

FIG. 12 is a block diagram of a card including supplemental information;

FIG. 13 is a user interface including a sequence of cards, as well as supplemental information and program completion indicators;

15 FIG. 14 is a block diagram of two sequences of cards displayed along perpendicular axes; and

FIG. 15 is a user interface including context-sensitive areas.

### **DETAILED DESCRIPTION**

20 Reference is now made to the figures in which like reference numerals refer to like or similar elements. For clarity, the first digit or digits of a reference numeral indicates the figure number in which the corresponding element is first used.

25 Throughout the specification, reference to "one embodiment" or "an embodiment" means that a particular described feature, structure, or characteristic is included in at least one embodiment of the present invention. Thus, appearances of the phrases "in one embodiment" or "in an embodiment" in various places throughout this specification are not necessarily all referring to the same embodiment.

30 As used herein, the term "coupled" refers not only to components that are directly connected, but also to components that are connected via one or more other components. Hence, the term "coupled" may also refer to components that

are in communication with one another, although no physical connection may exist.

Furthermore, the described features, structures, or characteristics may be combined in any suitable manner in one or more embodiments. In the following  
5 description, numerous specific details, such as examples of programming, software modules, user selections, network transactions, database queries, database structures, etc., are provided for a thorough understanding of the embodiments of the invention. Those skilled in the art will recognize, however, that the invention can be practiced without one or more of the specific details, or  
10 with other methods, components, materials, etc. In other instances, well-known structures, materials, or operations are not shown or not described in detail to avoid obscuring aspects of the invention.

As illustrated in FIG. 1, a typical system 100 for distributing media signals to subscribers includes one or more content sources 101 linked to plurality of set  
15 top boxes (STBs) 102 by a broadband network 103. As used herein, the term "media signals" should be broadly construed to include video and/or audio content, pictures, animations, text, software programs, etc. As such, content sources 101 may include television networks, websites, video servers, music servers, software archives, databases, and the like.

20 An STB 102 receives media signals from the content source(s) 101 via the network 103 and displays the same on a television (TV) 104 or similar display device. As its name implies, an STB 102 is typically located on or in close proximity to the TV 104. Conventionally, each TV 104 must have its own STB 102 in order to receive and display media signals.

25 The broadband network 103 is typically a cable TV network or a direct broadcast satellite (DBS) network, although other networks are possible. The STBs 102 are coupled to the network 103 directly or through one or more broadcast centers 105.

In the context of a cable TV network, a broadcast center 105 is referred to  
30 as a "head-end", *i.e.*, a centrally-located facility within a community in which TV programming is received from a local cable TV satellite downlink or other source and packaged for transmission to subscriber homes. A broadcast center 105 may also be embodied as a satellite broadcast center within a DBS network.

Broadcast centers 105 may be coupled directly to one another or through the broadband network 103. In some cases, broadcast centers 105 may be connected via other networks, one particular example of which is the Internet 108. Communication over the Internet 108 is accomplished using TCP/IP and other standard protocols.

For each STB 102, a remote control 106 is generally provided for convenient remote operation of the STB 102 and the TV 104. The remote control 106 may use infrared (IR), radio frequency (RF), or other wireless technologies to transmit control signals to the STB 102 and the TV 104.

FIG. 2 is a detailed block diagram of an advanced STB 102, such as a Motorola<sup>TM</sup> DCT5200<sup>TM</sup>, providing ITV features. As depicted, the STB 102 includes a tuner 202 for selectively receiving media signals from the broadband network 103 on different channels or frequencies. Various analog tuners 202 are available, such as the Broadcom<sup>TM</sup> BCM 3415<sup>TM</sup>.

Increasingly, TV broadcasts are being digitally encoded and multiplexed to maximize bandwidth usage. For instance, "digital" cable systems utilize MPEG (Moving Pictures Experts Group) compression to provide subscribers with many more channels than would be possible using analog techniques. Accordingly, a "digital" tuner 202 may include circuitry for selectively demodulating, demultiplexing, and decoding such content.

The STB 102 may also include a modem 203 for communication with the Internet 108 and/or the broadband network 103. The modem 203 may be embodied as a Motorola<sup>TM</sup> cable modem, which conforms, for instance, to the Data Over Cable Service Interface Specification (DOCSIS). Alternatively, the modem 203 may be adapted to communicate with a Public Switched Telephone Network (PSTN).

The STB 102 may also include a conditional access (CA) device 204 for decrypting media signals for digital, premium, and pay-per-view (PPV) channels or services (e.g., HBO<sup>TM</sup>, Showtime<sup>TM</sup>, OnDemand<sup>TM</sup>). A CA device 204 makes use of both scrambling and encryption technologies to prevent reception of a signal by unauthorized STBs 102. In one technique, encrypted messages, known as Entitlement Control Message (ECM) and Entitlement Management Message

(EMM), are used. CA devices 204 and techniques are known in the art and will not be discussed in greater detail.

The STB 102 further includes a display interface 206 for rendering media signals on an attached display device, such as a TV 104. A display interface 206 typically includes a graphical processor, a memory (frame buffer), a digital-to-analog converter (DAC), and various other supporting hardware for outputting media signals capable of being displayed by an analog or digital TV 104. A variety of display interfaces 206 are known, such as the ATI™ Xilleon™ 215s or Broadcom™ BCM7031.

The STB 102 also includes a remote interface 208 for receiving and decoding control signals sent by a remote control 106. As noted, various wireless techniques may be used, such as infrared (IR), radio frequency (RF), or the like. In one configuration, the remote interface 208 is embodied as an ATMEL™ Mega161™ IR microcontroller.

Typically, the STB 102 includes a memory 210 comprising a combination of one or more standard RAM, ROM, or EEPROM devices. The memory 210 is used for storing program code, user settings, and other data. Similarly, the STB 102 includes a hard drive 212 or other mass storage unit for storing media streams, applications, databases, etc.

The STB 102 also typically includes a CPU 214 for controlling the operation of the STB 102, including the other components thereof, which are coupled to the CPU 214 via a bus 215. The CPU 214 may be embodied as a microprocessor, microcontroller, digital signal processor (DSP), or other device known in the art. The CPU 214 performs logical and arithmetic operations based on program code stored within the memory 210.

To enable ITV functionality, the memory 210 of the STB 102 generally includes a number of software modules, objects, or applications. Of course, any of the described modules may be implemented using various combinations of software, hardware, and/or firmware.

For instance, the memory 210 may include a personal video recording (PVR) module 216 to facilitate digital recording of media signals. The popularity of PVR systems, such as TiVo™ and ReplayTV™, has tremendously increased in recent years. PVR systems provide a wide variety of desirable functions, such as

scheduled recording of TV broadcasts for time-shifting purposes, pausing (buffering) of live TV, instant replays, and the like.

The memory 210 may also include an EPG (electronic programming guide) module 218 that provides a subscriber with a view of upcoming television programming. The EPG module 218 may display programming information in various formats, such as a timeline, grid, or the like, allowing a subscriber to easily view upcoming or current programming. In addition, the EPG module 218 may interact with the PVR module 216 to allow a subscriber to select programs for recording directly from an EPG listing. The EPG module 218 may obtain programming information, for example, from the network 103 using the modem 203 or via out-of-band signaling from the broadcast center 105.

The memory 210 may further include a web browser 220, such as a version of Microsoft Internet Explorer™, to facilitate access to web content within the Internet 108. Similarly, the memory 210 may include an e-mail client 222, such as Microsoft Outlook™, a chat (instant messaging) client 224, such as MSN Messenger™, a videophone client 226, such as Microsoft Netmeeting™, and a media player/editor 228, such as Windows Media Player™ and/or Windows Movie Maker™.

Furthermore, the memory 210 may include an operating system (OS) 230, such as Windows XP™, Windows CE™, or Linux™ for managing the other modules described above. Middleware, such as Liberate™, may also be provided to facilitate interaction between the OS 230 and the described modules.

Unfortunately, advanced STBs 102 of the type depicted in FIG. 2 are relatively expensive. Moreover, as previously noted, each TV 104 must have a separate STB 102 for ITV access. Thus, the cost of enabling ITV features for multiple TVs 104 within a home can be prohibitive for many subscribers.

FIG. 3 is a block diagram of a home entertainment system 300 that provides ITV functionality to multiple TVs 104 without the need for several expensive STBs 102. As illustrated, the system 300 includes media center 302. In many respects, the media center 302 is similar to the STB 102 of FIG. 2, and may be embodied as an STB 102 with various modifications, as described below. The media center 302 may also be embodied as a home personal computer (PC) with suitable hardware and software modifications.



The system 300 also includes a number of relatively inexpensive media center extensions (MCXs) 304. Typically, one MCX 304 is provided for each TV 104 in the home for which ITV features are desired. An MCX 304 and may be coupled to a TV 104 using standard audio/video connections.

5 Each MCX 304 is communicatively coupled to the media center 302 via a home network 306. The home network 306 may be embodied as a 10/100 Mbps Ethernet (including a hub 308), an 802.11b wireless network (including a wireless LAN station 310), a HomePNA™ network, a HomeCNA™ network, a HomePlug™ network, an IEEE 1394 network, a Bluetooth™ network, or any  
10 other wired or wireless network. Many homes already include a suitable home network 306.

As described in greater detail below, the media center 302 functions as a centralized reception and distribution center for media signals (e.g., TV signals) within a home. The media center 302 receives media signals from the  
15 broadband network 103 using one or more tuners 202. The media center 302 then encodes the media signals into media streams (e.g., MPEG streams) and distributes the media streams to the appropriate MCXs 304.

Each MCX 304 decodes a media stream received from the home network 306 and renders the stream on an associated TV 104. Also, each MCX 304  
20 receives user commands from a remote control 106 or other input device, which the MCX 304 then relays to the media center 302. The commands, for example, may instruct one of the tuners 202 of the media center 302 to tune to a different media signal, changing what is displayed on a TV 104.

The system 300 is scalable to support any number of home TVs 104 by  
25 adding MCXs 304. Because the MCXs 304 are relatively inexpensive, providing ITV functionality to a new TV 104 is not a prohibitive investment for either a subscriber or a cable or satellite operator.

FIG. 4 is a more detailed block diagram of the home entertainment system 300 according to an embodiment of the invention. As depicted, the media center  
30 302 may include various components in common with a STB 102. For instance, a media center 302 may include a modem 203, CA device 204, display interface 206, remote interface 208, CPU 214, and memory 210. As such, the media

center 302 may directly function as an STB 102 to provide ITV functionality for one TV 104 in a household.

Of course, the precise selection and configuration of components of the media center 302 may vary from those of the STB 102. For clarity, however, components having similar functions are indicated herein by like reference numbers even though minor differences may exist between instantiations.

As described above, the media center 302 may include multiple tuners 202. While only two tuners 202 are depicted, any number of tuners 202 are contemplated within the scope of the invention. In one embodiment, a tuner 202 may be a modular device, such as an add-in card, which may be installed within the media center 302 by a user or a technician. For instance, the media center 302 may include a number of Peripheral Component Interconnect (PCI) bus slots, which may be configured to receive one or more add-in tuner cards.

As illustrated, the media center 302 may also include at least one MPEG encoder 402, such as an NEC<sup>TM</sup> uPD61xx encoder, for encoding or transforming media signals received from the network 103 into media streams for transmission to the MCXs 304. While MPEG-2 is used in one embodiment, a variety of other encoding schemes may be used within the scope of the invention, such as MPEG-1, MPEG-4, JPEG, JPEG-LS, H.261, and H.263. Accordingly, the invention should not be construed as being limited to MPEG-2 encoding. In certain embodiments, multiple encoders 402 may be provided, particularly where more than two tuners 202 are being used.

The media center 302 may additionally include a network interface 406 for communicating with a number of MCXs 304 over the home network 306. The configuration of the network interface 406 will vary depending on the type of home network 306. For instance, the network interface 406 may be embodied as a 10/100 Mbps Ethernet adapter, 802.11b wireless adapter, an IEEE 1394 ("firewire") adapter, or so forth.

As illustrated, the memory 210 of the media center 302 includes various software modules similar to those of the STB 102. For instance, the memory 210 of the media center 302 may include a PVR module 216, an EPG module 218, a web browser 220, an e-mail client 222, a chat client 224, a videophone client 226, and a media player/editor 228. As previously indicated, any of the described

modules may be implemented using any suitable combination of software, hardware, and/or firmware.

In addition to an operating system (OS) 230, such as Windows XP™, the memory 210 of the media center 302 may include an OS 404 for the MCXs 304, such as Linux™ or Windows CE™, as described in greater detail below.

In the depicted embodiment, the MCX 304 also includes certain components in common with an STB 102. For instance, the MCX 304 may include a display interface 206, a remote interface 208, a memory 210, a CPU 214, a bus 215, etc.

In addition, the MCX 304 may include an MPEG decoder 408 for decoding media streams received from the media center 302. The MPEG decoder 408 may be embodied as a separate MPEG decoding chip, as a software codec, or as part of a display interface 206, such as an ATI™ Xilleon™ 215s or Broadcom™ BCM7031. A variety of MPEG decoding solutions are known in the art.

The MCX 304 may further include a network interface 406 for receiving media streams from the media center 302 via the home network 306. In certain configurations, the MCX 304 may use the network interface 406 to boot (*i.e.*, load the MCX OS 404 into memory 210) from a copy stored within the media center 302. For instance, the network interface 406 of the MCX 304 may be compatible with the 3Com™ DynamicAccess™ managed PC boot agent or other network boot service. This eliminates the need for the MCX 304 to locally store the MCX OS 404 within a flash memory or hard drive 212, reducing the cost of the MCX 304.

FIG. 5 depicts the flow of data between a media center 302 and two MCXs 304. Those of skill in the art will recognize, however, that any number of MCXs 304 may be connected to the media center 302 via the home network 306.

As illustrated, the media center 302 receives a number of media signals 502 from the network 103. The media signals 502 may be analog TV signals, multiplexed digital cable or satellite TV signals, video-on-demand (VoD) signals, or other transmissions. Typically, a media center 302 receives hundreds of multiplexed signals 502 from the network 103 at the same time.

In general, each tuner 202 within the media center 302 may tune to one of the media signals 502. While components exist that may tune to multiple signals 502, such components should be properly described as including multiple tuners 202.

5       At least one encoder 402 within the media center 302 encodes the tuned media signals 502 into media streams 504 (e.g., MPEG streams) suitable for transmission over the home network 306. As noted, the media streams 504 may use other encoding schemes known in the art. Where the media signal 502 is already a media stream 504, in the case of "digital" cable, the encoder 402 is not  
10   used.

In certain configurations, the media streams 504 are buffered or stored within a hard drive 212 or other storage device. Once stored, the media stream 504 may be used or manipulated in various ways. For instance, the media stream 504 may be edited using the media player/editor 228, sent to another  
15   subscriber using the videophone client 226 or the e-mail client 222, indexed for subsequent playback by the PVR module 216, etc.

As described below, each media stream 504 is typically sent over the home network 306 to an MCX 304 at which a user has indicated a desire to watch the corresponding media signal 502 (e.g., TV channel). In some cases, a  
20   media stream 504 may be sent to multiple MCXs 304 if the same media signal 502 is to be watched on multiple TVs 104.

The receiving MCX 304 decodes the media stream 504 and renders the stream into an A/V signal 506 for display in a video window 507 on the TV 104. The video window 507 may include all or part of the TV screen. Various types of  
25   A/V connections may be used for transporting the A/V signal 506 from the MCX 304 to the TV 104, e.g., composite video, s-video, component video, stereo audio, optical/coaxial digital audio, radio frequency (RF), etc.

As an example of the foregoing, suppose the media center 302 receives two media signals 502, e.g., media signal #1 and media signal #2. Media signal  
30   #1 may be received by tuner #1, while media signal #2 may be received by tuner #2, as determined by users at MCX #1 and MCX #2, respectively.

In one configuration, media signal #1 is encoded into media stream #1, which is sent via the home network 306 to MCX #1. Similarly, media signal #2 is

encoded into media stream #2, which is sent via the home network 306 to MCX #2. Within MCX #1, media stream #1 is decoded and rendered into A/V signal #1, which is displayed on TV #1. Likewise, within MCX #2, media stream #2 is decoded and rendered into A/V signal #2 for display on TV #2.

5 One function of an MCX 304 is to allow users to interact with the media center 302 from TVs 104 located throughout the home. For instance, a user may specify which media signal 502 he or she desires to watch on a TV 104. To accomplish this, the subscriber activates a button of the remote control 106. For instance, the subscriber may press a "channel up" or "channel down" button.

10 The remote control 106 sends a corresponding IR command 508 (e.g., IR #1) to the MCX 304 (e.g., MCX #1). Of course, other wireless transmission techniques are possible, such as RF (radio frequency).

In one configuration, the receiving MCX 304 relays a user command 510 (e.g., user command #1) to the media center 302 via the home network 306. The  
15 user command 510 may instruct the media center 302 to tune one of its tuners 202 (e.g., tuner #1) to a particular media signal 502 and direct the corresponding media stream 504 to the requesting MCX 304 (e.g., MCX #1). The user command 510 may be any suitable type of message or data structure for conveying information about the IR command 508 to the media center 302.

20 As another example, a user of MCX #2 may press a button on the remote control 106 for playing back a media stream 504 selectively buffered within the hard drive 212 by the PVR module 216. As before, an IR command 508 (e.g., IR #2) is sent to the MCX 304, which is relayed as a user command 510 (e.g., user command #2) to the media center 302. The media center 302 retrieves the  
25 selected media stream 504 from the hard drive 212 and transports the stream 504 via the home network 306 to MCX #2, where it is decoded and rendered in the video window 507.

The media center 302 is also responsible, in one embodiment, for generating a Graphical User Interface (GUI) 512 on each TV 104. To accomplish  
30 this, the media center 302 sends graphical data 514 to each MCX 304, which are used by each display interface 206 to generate a GUI 512. As depicted, the TV 104 may display the GUI 512 simultaneously with the video window 507, although either the GUI 512 or the video window 507 may be exclusively

displayed. Both the GUI 512 and the video window 507 are included in the AV signal 506.

The graphical data 514 may be embodied, for instance, as low-level VGA (Video Graphics Array) commands which may be directly processed by circuitry within the display interface 206. Alternatively, the graphical data 514 may be graphical primitives understood by a thin-client module (not shown) within the MCX 304. In still other embodiments, the graphical data 514 may include higher-level data objects, such as graphics and text.

The GUIs 512 may be generated by, and may interact with, various software modules within the media center 302, e.g., the PVR module 216, the EPG module 218, the web browser 220, the e-mail client 222, the chat client 224, the videophone client 226, the media player/editor 228, etc. For example, in the depicted embodiment, graphical data #1 may be generated by the web browser 220, and the corresponding GUI #1 displayed on TV #1 may include a web browser interface that displays content retrieved from the Internet 108. Similarly, graphical data #2 may be generated by an EPG module 218, and the resulting GUI #2 on TV #2 may include an EPG listing.

FIG. 6 is a flowchart of a method 600 within a home entertainment system 300 for distributing media signals 502 to multiple televisions 104. A media center 302 receives 602 first and second media signals 502 from the network 103. As previously explained, first and second tuners 202 may be used for this purpose. At least one encoder 402 within the media center 302 encodes 604 the first and second media signals 502 into first and second media streams 504.

In one embodiment, the media center 302 sends 606 the first media stream 504 to a first MCX 304, while simultaneously sending 608 the second media stream 504 to a second MCX 304. The media streams 504 are sent via a home network 306 using standard network interfaces 406.

Within the first MCX 304, a decoder 408 decodes and renders 610 the first media stream 504 on a first TV 104. Likewise, within the second MCX 304, a decoder 408 decodes and renders 612 the second media stream 504 on a second TV 104.

One of the MCXs 304 receives 614 an IR command 508 to tune to a new media signal 502 (e.g., channel) on the associated TV 104. The MCX 304 relays

616 a user command 510 to the media center 302. One of the tuners 202 within the media center 302 then tunes 618 to the new media signal 502. The resulting media stream 504 is then sent to the MCX 304 for rendering and display.

As shown in FIG. 7, a GUI module 702 within the media center 302 is responsible, in one configuration, for generating the appropriate graphical data 514 that are used by the MCX 404 to display the GUI 512. The graphical data 514 may be embodied, for instance, as low-level VGA (Video Graphics Array) commands which may be directly processed by circuitry within the display interface 206 of the MCX 404. Alternatively, the graphical data 514 may be graphical primitives understood by a thin-client module (not shown) within the MCX 404. Various thin-client architectures are known in the art, such as Citrix™. In still other embodiments, the graphical data 514 may include higher-level data objects, such as graphical images and text.

In one embodiment, the GUI module 702 generates GUIs 512 to interface with various software modules within the media center 302, such as the PVR module 216, EPG module 218, web browser 220, e-mail client 224, videophone client 226, media player/editor 228, etc. For instance, in the depicted, embodiment, the GUI module 702 is in communication with the EPG module 226 and generates graphical data 514 for displaying an GUI 512 including an EPG (Electronic Program Guide) 704.

As previously noted, an EPG 704 is a listing of current or upcoming TV programming. Typically, an EPG 704 is displayed in a grid format, with rows and columns corresponding to either time segments or TV channels. EPGs 704 of the type illustrated are disclosed in U.S. Patent No. 5,479,266 to Young et al.

Another GUI 512 that may be generated by the GUI module 702 for display on a TV 104 is discussed with reference to FIGs. 8-15. As previously noted, the home entertainment system 300 provides access to a plurality of selectable options, such as TV channels, programs, applications, digital media files, etc. For instance, the system 300 may provide access to literally hundreds of broadcast TV channels, pay-per-view (PPV) channels, Video-on-Demand (VoD) streams, music channels, data feeds, web pages, stored PVR recordings, digital photographs, audio (MP3) files, and the like.

As shown in FIG. 8, each selectable option may be associated with a card 800. A card 800 is an object or other suitable data structure that provides information about and/or access to an available option within a system 300. A card 800 may be a container of all of the attributes, actions, and/or states needed to facilitate interaction with the option represented thereby. Cards 800 may be stored in any suitable format within a memory or disk drive of a system 300.

Each card 800 may include a graphical representation 802 for display in the GUI 512, as described in detail below. The graphical representation 802 may include various types or combinations of artwork, digital photography, captured video frames, animations, or the like.

As depicted in FIG. 8, cards 800a-c may be used to represent television programs or channels. The television programs may be ongoing (live), upcoming, or previously-recorded (e.g., buffered by the PVR module 216 using the hard drive 212). In addition to a graphical representation 802, such cards 800 may include, for instance, a channel number 804, a channel name or identifier 806, a starting time 808, a running time 810, and a text description 812. Of course, cards 800 representing other types of options may include additional or different types of information, such as audio/video clips, file or path names, network addresses (URLs), etc.

The graphical representations 802 associated with cards 800 may have different levels of specificity or granularity. For instance, a graphical representation 802a may correspond generally to a television series, e.g., "3<sup>rd</sup> Rock from the Sun", while another graphical representation 802b may correspond to a television station or network, e.g., "CBS". In other embodiments, a graphical representation 802 may correspond to a specific episode of a television series (e.g., a series premier). In still other embodiments, a generic graphical representation 802 may be provided, which may be overlaid by the channel number 804, text description 812, or other information, where a more specific card 800 is not available.

Cards 800 may be generated locally within a media center 302 or may be received by the media center 302 through the network 103 using HTTP (hypertext transfer protocol), FTP (file transfer protocol), ATVEF (advanced television enhancement forum) triggers, etc. In one embodiment, a card 800 may



be received with data encoded in the vertical blanking interval (VBI) of a television signal. Additionally, information associated with cards 800 (e.g., channel number 804, starting time 808, running time 810) may be dynamically updated with information received in ATVEF triggers.

5 Referring to FIG. 9, a plurality of cards 800 may be linked or grouped together in a package or sequence 900. The sequence 900 may be circular (as depicted), linear, or configured in other ways. The sequence 900 may be linked in numerical order by channel number 804, in alphabetical order by the text description 812, or in other preset or user-defined ways. For instance, the  
10 sequence 900 may be determined based on one or a combination of other inputs, such as user profile information, user preferences, external events or data feeds (e.g., telephone rings, PVR notifications, alerts for external programming sources).

In the illustrated embodiment, one card 800a in the sequence 900 is active  
15 or in "focus". As shown, the active card 800a may be displayed within a focus area 902 of a GUI 512 displayed on the TV 104. For brevity, the phrase "displaying a card" refers herein to displaying a graphical representation 802 associated with the card 800. Other information associated with the card, e.g., the channel number 804 or text description 812, may or may not be displayed.

20 A focus area 902 is a single location of the GUI 512 at which the cards 800 are successively displayed (displayed one at a time in sequence). The focus area 902 may be located at a central or visually dominant location of the GUI 512, although the invention is not limited in this respect. As used herein, the term "focused navigation" refers to a technique of displaying a sequence 900 of cards  
25 800 within a focus area 902.

In response to a single initiating action by a user, the cards 800 in a sequence 900 are successively displayed within the focus area 902. Where the sequence 900 is circular, the successive display of cards 800 may continue indefinitely until halted by the user by a subsequent action, as described more  
30 fully below.

The single user action to initiate navigation may be pressing (or pressing and holding down) a button on the remote control 106. For example, the user may press an "Up" button to initiate the successive display in a first direction

within the sequence 900 (indicated by line 904), and press a "Down" button to initiate navigation in the opposite direction (indicated by line 906). Alternatively, the user may speak a command into a microphone (either within the MCX 904 or remote control 106) to initiate navigation. Of course, the user may initiate  
5 navigation in a variety of other ways within the scope of the invention.

In one embodiment, the sequence 900 of cards 800 is successively displayed at a rate selected by the user. For instance, initially pressing the "Up" button may cause the sequence 900 to be displayed at a rate of two cards 800 per second. As the user continues to hold the "Up" button, the rate may increase  
10 gradually or in steps to any practical rate within the limit of a typical user's ability to recognize individual cards 800 when they are displayed. Many users are able to recognize individual cards 800 at a rate of seven or more cards 800 per second (420 per minute), facilitating rapid navigation of available options.

The cards 800, when displayed within the focus area 902, may be  
15 sufficiently large to permit user recognition from a comfortable viewing distance for the particular TV 104. Thus, unlike PC icons, which typically occupy as little as 1/200 of the display area of the TV 104, the displayed cards 800 (and the card 800 in the focus area 902 in particular) may occupy between 1/10 and 1/4 of the total display area.

When the user sees a card 800 being displayed of a channel or option that  
20 she desires to select or view, the user may take some additional terminating action and the successive display of cards 800 is halted. For example, where navigation was initiated by pressing and holding down the "Up" button, the user may release the "Up" button to discontinue navigation. In an alternative  
25 embodiment, where the successive display was initiated simply by pressing a button, the user may press the same or a different button to halt the successive display. Of course, the user may discontinue navigation in a variety of other ways within the scope of the invention.

If the user's reaction time is fast enough, the card 800 representing the  
30 desired channel remains displayed in the focus area 902 once navigation is discontinued. However, the user's reaction time may not be fast enough and one or more cards 800 may be subsequently displayed. In such a case, the user may manually backtrack to the desired card 800 by repeatedly activating a suitable

control on the remote control 106. For example, briefly pressing the “Up” or “Down” buttons may result in the previous or next card 800, respectively, being displayed. Alternatively, as described in greater detail below, the system may attempt to determine the delay between the user recognizing the desired card 800 and taking the subsequent action and compensate for that delay by reverting to a previously-displayed card 800.

The user may select the channel or option associated with the displayed card 800 by taking a selection action. For instance, the user may press a “Select” button on the remote control 106. Alternatively, the selection action may simply be waiting a set amount of time without activating any controls on the remote control 106.

The effect of activating the card 800 will vary depending on the type of card 800. For instance, in the case of a card 800 representing a live television program, the GUI 512 may be replaced by a full-size version of the program. Alternatively, activating a card 800 corresponding to a purchase opportunity may result in the display of a web browser directed to a particular website.

As shown in FIG. 14, one or more previous and next cards 800 within the sequence 900 may be displayed along an axis (not shown) of the GUI 512 to provide the user with a more complete navigational context within the sequence 900. In one embodiment, the axis is an imaginary line that extends across the GUI 512 in a particular direction and intersects the focus area 902. For example, at least a subset of the sequence 900 of cards 800 may be displayed along a vertical axis, with the active card 800a being displayed in the focus area 902. In alternative embodiments, the cards 800 may be displayed along horizontal or diagonal axes, or in other suitable ways.

When a user activates one of the navigation buttons of the remote control 106 (e.g., the “Up” or “Down” buttons), the displayed cards 800 in the sequence 900 may be scrolled (e.g., shifted or cycled) downward or upward, respectively, with a new card (e.g., card 800c or 802f) entering the focus area 902. Alternatively, “Left” or “Right” button, if available, may be used for the same purpose.

As depicted, the card 800a in the focus area 902 may be visually emphasized in various ways. For example, the card 800a may be enlarged

relative to the other displayed cards 800. Alternatively, the card 800a may be animated, marked, illuminated, highlighted, or otherwise set apart from the other cards 800.

5 In certain embodiments, if the user allows a card 800 representing a live television program to remain in the focus area 902 for a certain amount of time (e.g., 2 seconds), the card 800a may be overlaid by a video window 507 showing the live television program. Furthermore, if the user continues to linger on the card 800a (or if the user presses the "Select" button), the video window 507 may be enlarged 1002 to fill the entire TV 104. Other types of cards 800 may exhibit  
10 different types of behaviors when the card 800 remains in the focus area 902 for an established period of time.

Where the cards 800 represent live television programs, a card 800 corresponding to the currently-tuned channel (at the current date and time) may be selected by default for display in the focus area 902 each time the GUI 512 is  
15 shown. This may occur, for instance, when the user is watching TV and presses a button (such as the "Select" button 124) in order to display the GUI 512. Additionally, an indication of the currently-displayed card 800 in the focus area 902 may be stored in non-volatile memory or otherwise maintained such that if a reset condition occurs (e.g., the STB 106 is rebooted or reset after a power loss,  
20 etc.) the last-displayed card 800 may be restored to the focus area 902.

Referring to FIG. 11, cards 800 may include one or more alternative graphical representations 1102, which may be displayed when the card 800 enters the focus area 902. As depicted, cards 800c-f displayed outside of the focus area 902 are shown using a first graphical representation 802c-f. However,  
25 when the card 800a enters the focus area 902, the alternative graphical representation 1102 is shown. Providing an alternative graphical representation 1102 allows a designer to provide a more detailed or higher-resolution image for display in the focus area 902, which may be enlarged relative to other graphical representations 802 outside of the focus area 902.

30 In certain implementations, various types of supplemental information, such as text descriptions 812, may be displayed next to the graphical representations 802, 1102 in the GUI 512 to aid the user in identifying and knowing the status of the corresponding options. Sometimes a graphical

representation 802 may simply be a picture or logo, which may not be familiar to every user. The addition of a text description 812 is helpful in such cases.

The text description 812 may be displayed above, below, or to the side of the graphical representation 802, 1102. Moreover, the text may be of a suitably large size to be easily discernable by the user from a normal viewing distance. During navigation, the text descriptions 812 are shifted or cycled with the corresponding graphical representations 802, 1102.

In the depicted embodiment, the text descriptions 812 identify a television programs or series, and are shown to the right of the corresponding graphical representations 802. Of course, many other types of text descriptions 812 may be provided, and different placements or orientations of the text descriptions 812 are contemplated.

As shown in FIG. 12, a text description 812 may be overlaid or superimposed over a graphical representation 802, 1102. This may be accomplished using various techniques, such as configuring a displayed card 800 with multiple graphical "layers", each layer representing either the graphical representation 802, 1102, a text description 812, or other display element.

In the depicted embodiment, a card 800 may include or be associated with other types of supplemental information, such as a title 1202 and/or synopsis 1204, each of which may be likewise superimposed over the graphical representation 1102. All such information displayed on or in connection with a card 800 is considered to be within the scope of the invention.

In other embodiments, a program completion indicator 1206 may be displayed on or near a graphical representation 802, 1102 of a card 800. The program completion indicator 1206 graphically (and/or textually) indicates the amount of a live television program that has been missed and/or is left to watch. The indicator 1206 may take various forms, such as the pie chart of FIG. 12 or the bar graph of FIG. 13. Additionally, the indicator 1206 may include a numerical percentage indicative of the program's completion status. Such an indicator 1206 may be valuable to a user in deciding whether to watch a program, particularly where a program is nearing completion.

The system 300 may include a clock (not shown) that maintains an indication of the current time. Based on the starting time 808 associated with a

card 800, the system 300 may calculate how much of the program has been missed and generate an appropriate graph and/or text message. For instance, as shown in FIG. 12, if the current time is 7:40PM, a pie chart may indicate that 67% of "3<sup>rd</sup> Rock from the Sun" has been missed. In the depicted embodiment, the program completion indicator 1206 may be superimposed over the graphical representation 1102 as described above.

Referring to FIG. 13, a displayed card 800 may be accompanied by an status indicator 1302 that provides status information concerning the represented option. For instance, the status indicator 1302 may relate to the current status (i.e. position, standing, state of affairs, condition, situation) of people, things, or events within an ongoing (live) television program.

For example, during a sporting event, such as a football or baseball game, the status indicator 1302a may display the score, field position, down, inning, strike count, clock, etc. In other embodiments, the status indicator 1302 may indicate a person being interviewed on a talk show, the current prize level or question in a suitable game show (e.g., "Who Wants to be a Millionaire<sup>®</sup>"), or a description of an item being currently offered on a shopping channel (e.g., QVC<sup>®</sup>).

In other embodiments, the status indicator 1302 may relate generally to the subject matter of a represented television program and not to any event being currently depicted. For instance, in the case of a card 800 representing CNN/fn<sup>®</sup>, a status indicator 1302b may be embodied as a stock ticker. Alternatively, a status indicator 1302c could include a news headline. Similarly, a weather forecast could be shown in connection with a card 800 representing The Weather Channel<sup>®</sup>.

The status indicator 1302 may be generated from information stored within the card 800. For instance, where a sporting event is being tape delayed, score information may be stored within a corresponding card 800, which may then be received by the system 300. Alternatively, where the system 300 already includes a card 800 representing the sporting event, score information within the card 800 may be updated using various techniques, such as ATVEF triggers. In still other embodiments, the system 300 may not store such information within a

card 800, but may include a link, such as a URL, to a website from which the information may be retrieved on demand using HTTP or other suitable protocols.

In one configuration, a card 800 may represent a television program recorded by the PVR module 216 with the system 300. The card 800 may include a file or path name (not shown) to a media file stored within a hard disk drive 212 or the like of the system 300. In such an embodiment, the status indicator 1302c may indicate when the program was recorded, whether the program has been watched, and/or how much of the program is left to watch.

Of course, a variety of other status indicators 1302 may be provided for different types of cards 800 indicating the status of functions, operations, or tasks associated with a represented option. All such status indicators 1302 used in connection with cards 800 are considered to be within the scope of the invention.

All of the above-described supplemental information that may be displayed with cards 800, e.g., text descriptions 812, titles 1202, synopses 1204, program completion indicators 1206, status indicators 1302, and the like, may be fully user configurable, such that a user may decide whether and how much of such information may be displayed. Moreover, the makeup and organization of displayed sequences 900 of cards may be configured by a user in any suitable manner.

Referring to FIG. 14, multiple sequences 900a-b including different types of cards 800 may be displayed simultaneously. For instance, one or more cards 800 from a sequence 900a representing television programs may be displayed as described in reference to FIG. 14. In addition, one or more cards 800 from a sequence 900b representing interactive channels, applications, or digital media, may also be displayed.

As illustrated, the second sequence 900b may be displayed horizontally, perpendicular to the first sequence 900a, such that the sequences 900a-b intersect at (and define) the focus area 902. Any number of sequences 900 may be displayed on the GUI 512 simultaneously. Of course, the selection of vertical and horizontal for the sequences 900a-b is merely exemplary and not required.

In the depicted embodiment, "Up" and "Down" buttons may be used to shift or cycle the vertically-displayed sequence 900a within the GUI 512 in order to bring one of the corresponding cards 800a-e into the focus area 902. Likewise,

"Left" and "Right" buttons may be used to shift or cycle the horizontally-displayed sequence 900b to bring one of the corresponding cards 800g-k into the focus area 902.

5 In one implementation, bringing a card 800 from one sequence 900 into the focus area 902 will determine or change which other sequence 900 is displayed. For example, bringing the card 800h (TV shape) from the horizontal sequence 900b into focus may result in the vertical sequence 900a (television programs) being displayed. Alternatively, bringing the card 800g (envelope shape) into focus may result in a vertical sequence 900 (not shown) corresponding to e-mail messages or contacts. Likewise, bringing the card 800i  
10 (videophone shape) into focus may result in a vertical sequence 900 of a videoconferencing buddy list, while the card 800j (VCR shape) may display a vertical sequence 900 of television programs recorded by a PVR. In alternative embodiments, a selection from a vertical sequence 900 may affect which  
15 horizontal sequence 900 is displayed.

Referring to FIG. 15, a number of context-sensitive areas 1500 may be provided within the GUI 512. As depicted, the context-sensitive areas 1500 may be quadrants of the GUI 512 formed by the intersection of two displayed sequences 900a-b. Alternatively, the context-sensitive areas 1500 may be  
20 hemispheres formed by a single sequence 900. However, any number of context-sensitive areas 1500 may be provided within the scope of the invention. Unlike the embodiment depicted in FIG. 11, the context-sensitive areas 1500 may be in fixed locations outside of the focus area 902 or the area used by the displayed sequences 900a-b.

25 In one embodiment, a context-sensitive area 1500a in a lower-right quadrant of the GUI 100 may display supplemental information (e.g., channel numbers 804, channel identifiers 806, starting times 808, running times 810, text descriptions 812, titles 1202, synopses 1204, program completion indicators 1206, status indicators 1302, etc.) related to the card 800 in the focus area 902.  
30 The supplemental information may be obtained from the card 800, itself, or retrieved from a network using HTTP, ATVEF triggers, or other suitable techniques.



Additionally, a context-sensitive area 1500b in an upper-right quadrant may be used for displaying advertisements related to the card 800 in the focus area 902. For example, in an episode of "3<sup>rd</sup> Rock from the Sun" featuring Dick Solomon driving a new BMW®, a suitable graphical image, video clip, flash animation, or the like, may be displayed. The advertisement may be displayed in response to receipt of an ATVEF trigger by the system 300, although other mechanisms may be used within the scope of the invention.

A context-sensitive area 1500c in an upper-left quadrant may be used for branding purposes. For instance, as shown in FIG. 15, the context-sensitive area 1500c may show a logo for a provider (e.g., cable or satellite) of the television programs represented by the sequence 900a.

Finally, a context-sensitive area 1500d in a lower-left quadrant may be used to display system notes and instructional text. For example, where the user is navigating a sequence 900a of cards 800 corresponding to television programs, instructional text may be provided that prompts the user to select a television program. Other uses may include e-mail, videophone, or instant messaging notifications, reminders, warnings, or the like.

The relative sizes of the context-sensitive areas 1500 may vary depending, for instance, on the location of the intersection (focus area 902) of the displayed sequences 900a-b. If the intersection is near the center of the GUI 512, the context-sensitive areas 1500 may be equal in size; otherwise, the relative sizes of the context-sensitive areas 1500 may vary.

In alternative embodiments, one or more areas of the GUI 512 may display user-specific or user-targeted information, i.e. customized information for a specific user. The information may be targeted based on a user profile stored within or accessible to the system 300. For instance, the system 300 may be configured to display the BMW advertisement of FIG. 15 if the user profile indicates that a user is a male, age 40 or above, with an income exceeding \$150,000 per year. Of course, a variety of other user-specific or user-targeted information may be provided within the scope of the invention.

In certain implementations, a loop of sequentially-displayed supplemental information items may be displayed within one or more of the context-sensitive areas 1500 of the GUI 512. For instance, a context-sensitive area 1500 may

display a sequence of advertisements, news headlines, weather reports, or other information. The individual items may be configured to be displayed at or for certain time periods, as configured by the user or a content producer.

Multiple supplemental information loops may be displayed simultaneously  
5 in different context-sensitive areas 1500. In such an embodiment, the loops may be synchronized in various ways. For instance, multiple loops may be synchronized in order to not simultaneously display an identical or similar item of supplemental information in two or more context-sensitive areas 1500. Likewise,  
10 multiple loops may be synchronized such that items of supplemental information may rotate through different context-sensitive areas 1500 in a carousel fashion. In this manner, advertising need not always be displayed in the upper-right area 1500 of the GUI 512.

In view of the foregoing, the present invention offers a number of advantages not found in conventional approaches. Graphical user interfaces 512  
15 for personal video recording, e-mail, instant messaging, web browsing, and the like, may be provided to multiple TVs 104 throughout the home. Unlike conventional systems, however, expensive STBs 102 are not required at every TV location. Instead, relatively inexpensive MCXs 304 may utilize the processing capabilities of a centralized home media center 302 to provide the ITV features to  
20 additional TVs 104 at a substantially lower incremental cost.

While specific embodiments and applications of the present invention have been illustrated and described, it is to be understood that the invention is not limited to the precise configuration and components disclosed herein. Various  
25 modifications, changes, and variations apparent to those skilled in the art may be made in the arrangement, operation, and details of the methods and systems of the present invention disclosed herein without departing from the spirit and scope of the invention.

What is claimed is:

### Claims

1. A home entertainment system comprising:

5 a media center including:

a user interface module to generate graphical data representing a plurality of user interfaces; and

a network interface to send the graphical data to a home network; and

10 a plurality of extension devices, each extension device including:

a network interface to receive the graphical data for a user interface from the home network; and

a display interface to render the graphical data into the user interface on a separate television.

15 2. The system of claim 1, wherein the media center further comprises: an encoder to encode a media signal received by the media center into a media stream, wherein the network interface is to send the media stream to at least one extension device via the  
20 home network.

3. The system of claim 2, wherein an extension device is to receive the media stream from the home network, the extension device further comprising:

25 a decoder to decode the media stream back into a media signal, wherein the display interface is to render the decoded media signal on the television.

4. The system of claim 3, wherein the media center further comprises:  
30 a storage device to buffer the media stream.

5. The system of claim 1, further comprising:

a plurality of remote control devices, each remote control device being associated with a different extension device.

5 6. The system of claim 5, wherein each extension device further comprises:  
a wireless receiver to receive a user command from an associated remote control device, and wherein the network interface of the extension device is to relay the user command to the media center.

10

7. The system of claim 1, wherein at least one user interface comprises an Electronic Program Guide (EPG).

15 8. The system of claim 1, wherein at least one user interface comprises:  
a focus area intersected by a first axis; and  
a first sequence of cards displayed along the first axis, each card graphically representing an available option, one card being displayable within the focus area; wherein the first sequence of cards is to be scrolled along the first axis in response to an  
20 initiating action to progressively change the card within the focus area; and wherein the scrolling of cards is to be halted in response to a terminating action to show a selected card from the first sequence within the focus area.

25

9. The system of claim 8, wherein at least one card represents a television channel.

30 10. The system of claim 8, wherein the at least one user interface further comprises:

at least one context-sensitive area that displays supplemental information related to the card within the focus area.

11. The system of claim 10, wherein the supplemental information is at least one of a title, a synopsis, a channel number, a channel name, a starting time, a running time, an advertisement, and instructional text.

5 12. The system of claim 8, wherein the at least one user interface further comprises a program completion indicator.

13. The system of claim 12, wherein the program completion indicator graphically indicates how much of television program represented by a card has  
10 been missed.

14. The system of claim 12, wherein the program completion indicator is one of a pie chart, a bar graph, and a numerical percentage.

15 15. The system of claim 8, wherein the focus area is intersected by a second axis perpendicular to the first axis, the at least one user interface further comprising:

a second sequence of cards displayed along the second axis, each card graphically representing an available option, one card  
20 being displayable within the focus area; wherein the second sequence of cards is to be scrolled along the second axis in response to an initiating action to progressively change the card within the focus area; and wherein the scrolling of cards is to be halted in response to a terminating action to show a  
25 selected card from the second sequence within the focus area.

16. The system of claim 15, wherein the second sequence is determined by the selected card from the first sequence.

30

17. The system of claim 8, wherein the initiating action comprises pressing a first button on a remote control device, and wherein the terminating

action is one of pressing the first button a second time, releasing the first button, and pressing a second button on the remote control device.

18. The system of claim 8, wherein the first sequence of cards are to be  
5 scrolled along the first axis at a user-selected rate.

19. A media center comprising:

a user interface module to generate graphical data representing a user  
interface;

10 an encoder to encode a media signal received by the media center into a  
media stream; and

a network interface to send the graphical data and media stream via a  
home network to an extension device, wherein the extension device  
is to render the graphical data and media stream into a user  
15 interface on a television.

20. An extension device for the media center of claim 19, the extension  
device comprising:

a network interface to receive the graphical data and media stream from  
20 the home network;

a decoder to decode the media stream back into a media signal; and  
a display interface to render the graphical data and media stream into a  
user interface on the television.

21. A method within a home entertainment system comprising:

25 connecting a media center to a plurality of extension devices through a  
home network;

generating graphical data within the media center representing a plurality  
of user interfaces;

30 transporting the graphical data to the plurality of extension devices through  
the home network; and

rendering the graphical data received by each extension device into one of  
the plurality of user interfaces on a separate television.

22. The method of claim 21, further comprising:  
receiving a media signal from a media source at the media center;  
transforming the media signal into a media stream; and  
5 transporting the media stream to an extension device via the home  
network.

23. The method of claim 22, further comprising:  
receiving the media stream at the extension device;  
10 transforming the media stream back into a media signal; and  
rendering the media signal on an attached television.

24. The method of claim 22, further comprising:  
buffering the media stream within a storage device of the media center.

25. The method of claim 21, further comprising:  
providing a remote control device for each extension device.

26. The method of claim 25, further comprising:  
20 receiving a user command from a remote control device at an extension  
device; and  
relaying the user command to the media center via the home network.

27. The method of claim 21, wherein rendering comprises rendering the  
25 graphical data into an Electronic Program Guide (EPG).

28. The method of claim 21, wherein at least one user interface  
includes a focus area intersected by a first axis, and wherein rendering  
comprising:  
30 storing a first sequence of cards, each card graphically representing an  
available option within the home entertainment system;  
displaying at least a subset of the first sequence of cards along the first  
axis, one card being displayable within the focus area;

scrolling the first sequence of cards along the first axis in response to an initiating action to progressively change the card within the focus area to a next card within the first sequence; and discontinuing the scrolling of cards in response to a terminating action to show a selected card from the first sequence within the focus area.

29. The method of claim 28, wherein at least one card represents a television channel.

30. The method of claim 28, wherein rendering further comprises: displaying supplemental information related to the card within the focus area in at least one context-sensitive area of the at least one user interface.

31. The method of claim 30, wherein displaying supplemental information comprises displaying at least one of a title, a synopsis, a channel number, a channel name, a starting time, a running time, an advertisement, and instructional text.

32. The method of claim 28, wherein rendering further comprises: displaying a program completion indicator within the at least one user interface.

33. The method of claim 32, wherein the program completion indicator graphically indicates how much of television program represented by a card has been missed.

34. The system of claim 32, wherein the program completion indicator is one of a pie chart, a bar graph, and a numerical percentage.

35. The method of claim 28, wherein the focus area is intersected by a second axis perpendicular to the first axis, and wherein rendering further comprises:



storing a second sequence of cards, each card graphically representing an available option within the home entertainment system;  
displaying the second sequence of cards along the second axis, each card graphically representing an available option, one card being  
5 displayable within the focus area;  
scrolling the second sequence of cards along the second axis in response to an initiating action to progressively change the card within the focus area; and  
discontinuing the scrolling of cards in response to a terminating action to  
10 show a selected card from the second sequence within the focus area.

36. The method of claim 35, further comprising:  
determining the second sequence based on the selected card from the  
15 first sequence.

37. The method of claim 28, wherein the initiating action comprises pressing a first button on a remote control device, and wherein the terminating action is one of releasing pressing the first button a second time, releasing the  
20 first button and pressing a second button on the remote control.

38. The method of claim 28, wherein scrolling comprises scrolling the first sequence of cards at a user-selected rate.

25 39. A method within a media center comprising:  
generating graphical data representing a user interface;  
receiving a media signal from a media source;  
encoding the media signal into a media stream; and  
transporting the graphical data and the media stream via a home network  
30 to an extension device, wherein the extension device is to render the graphical data and media stream into a user interface on a television.

40. A method of claim 39, further comprising:  
receiving the graphical data and the media stream from the home network  
at the extension device;  
decoding the media stream back into a media signal; and  
5 rendering the graphical data and the media stream into a user interface on  
the television.

10 41. A home entertainment system comprising:  
means within a media center for generating graphical data to represent a  
plurality of user interfaces;  
means for transporting the graphical data to a plurality of extension  
devices via a home network; and  
15 means within each extension device for rendering the graphical data into  
one of the plurality of user interfaces on an attached television.

42. A computer program product comprising program code for  
performing a method within a home entertainment system, the method  
20 comprising:  
generating graphical data within a media center to represent a plurality of  
user interfaces;  
transporting the graphical data to a plurality of extension devices through a  
home network; and  
25 rendering the graphical data received by each extension device into one of  
the plurality of user interfaces on a separate television.

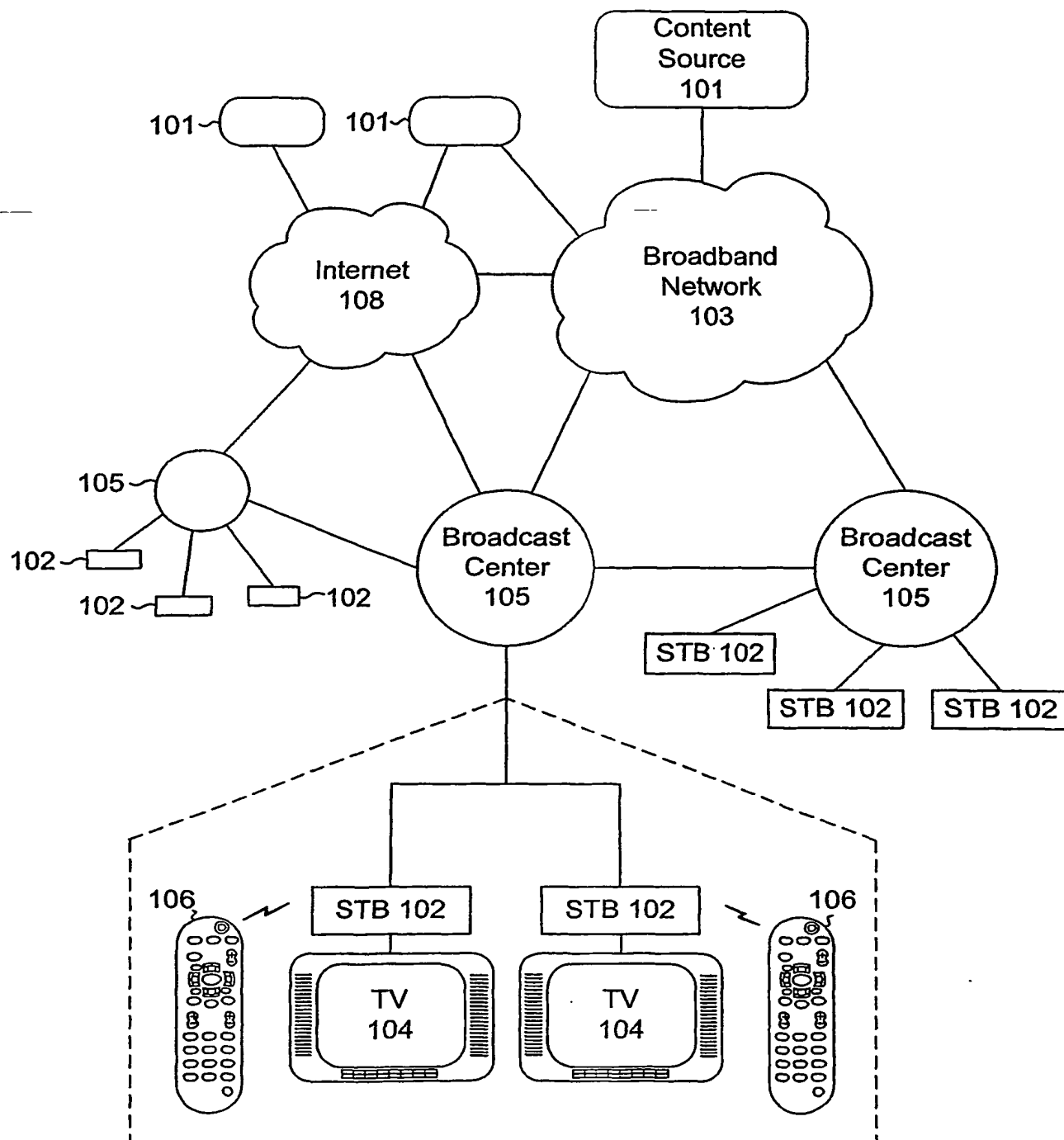
100

FIG. 1

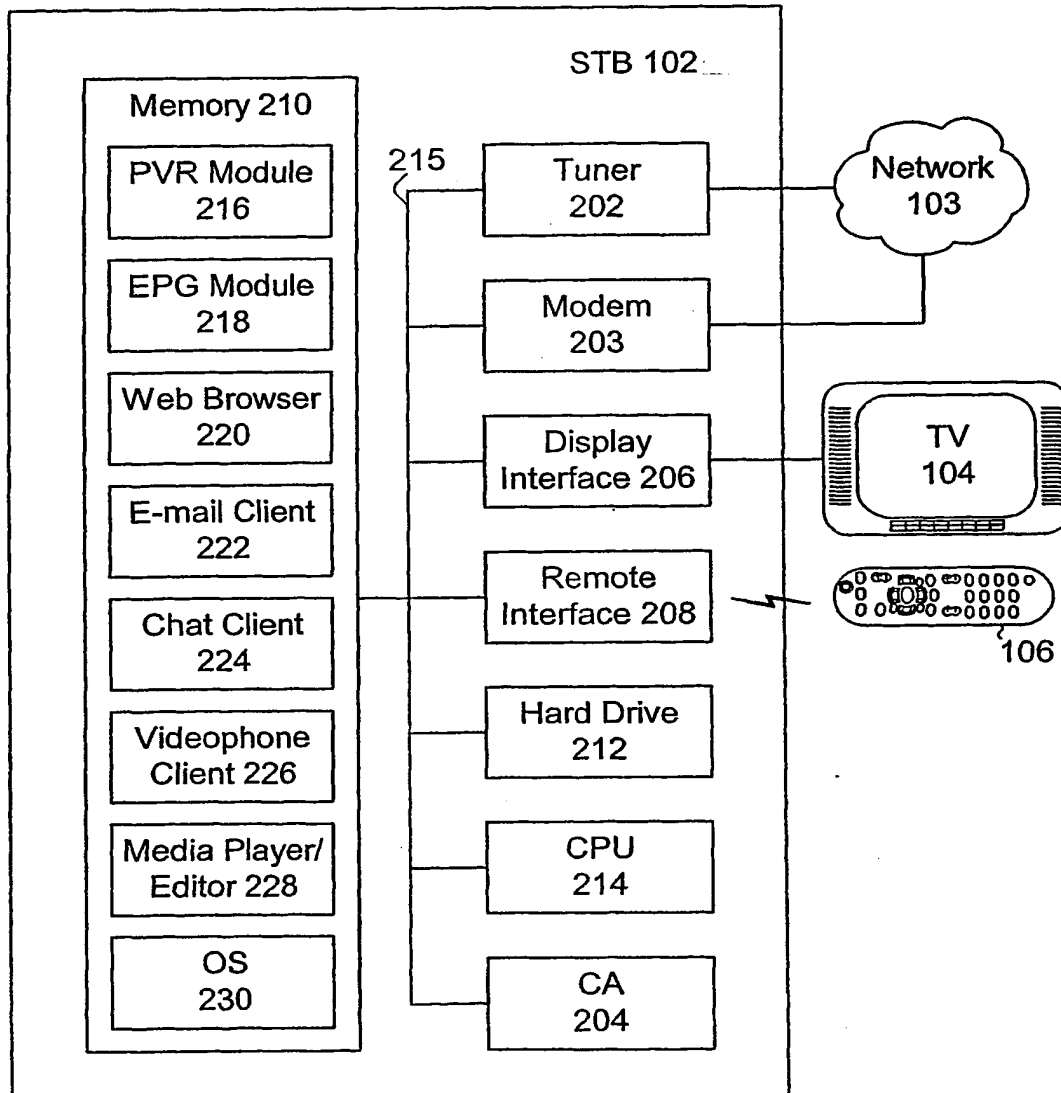


FIG. 2  
(Prior Art)

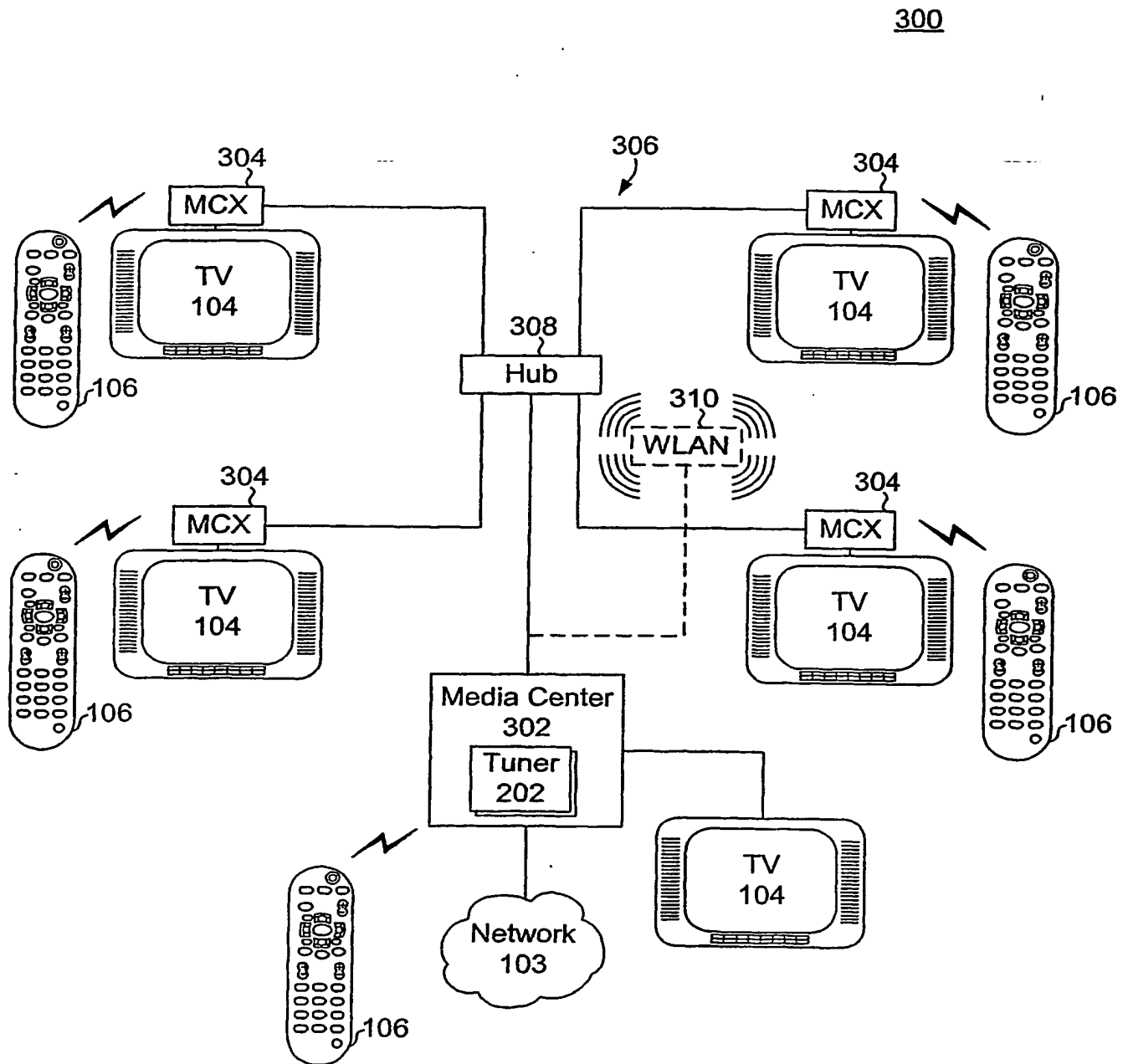


FIG. 3

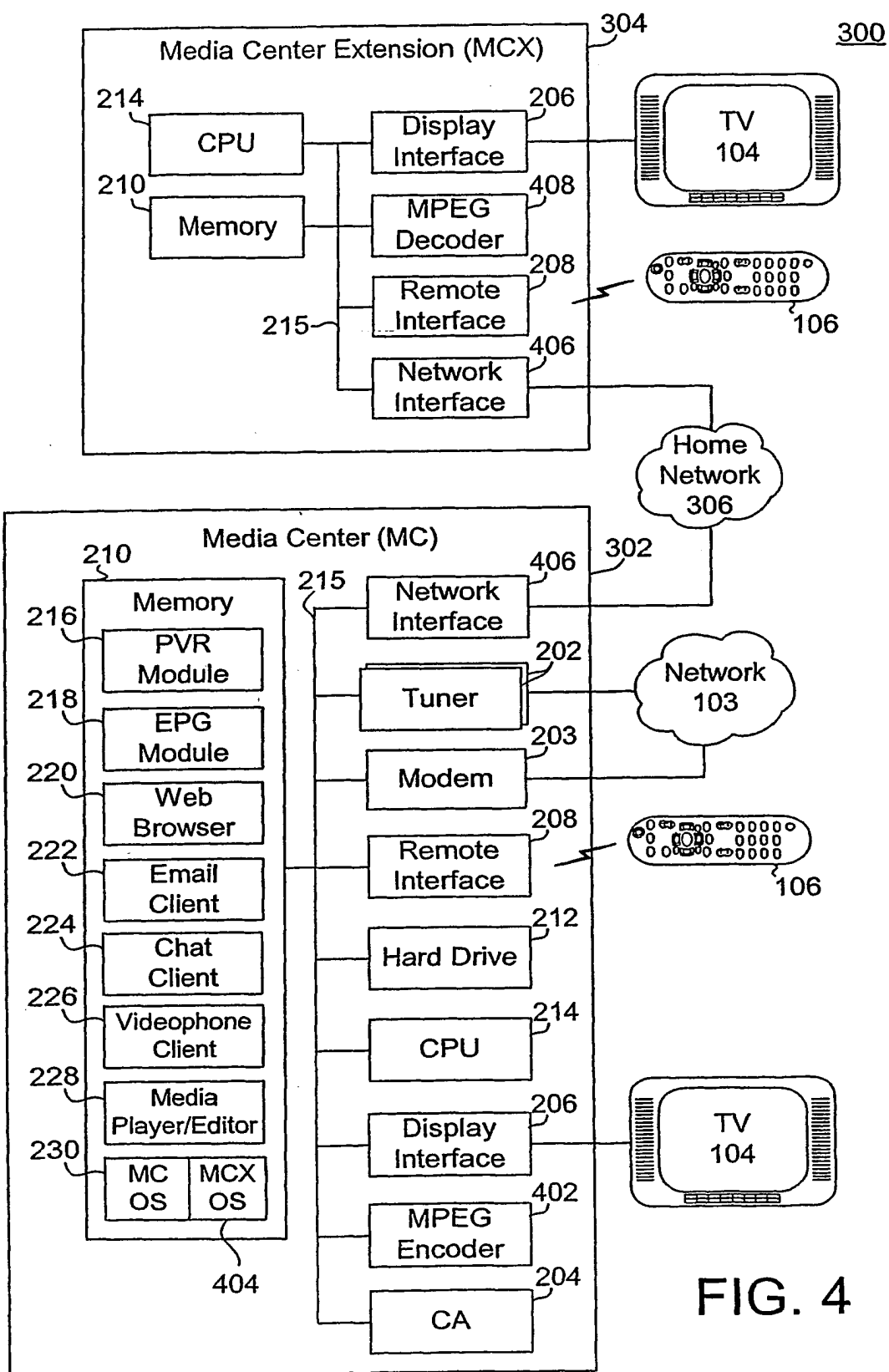


FIG. 4

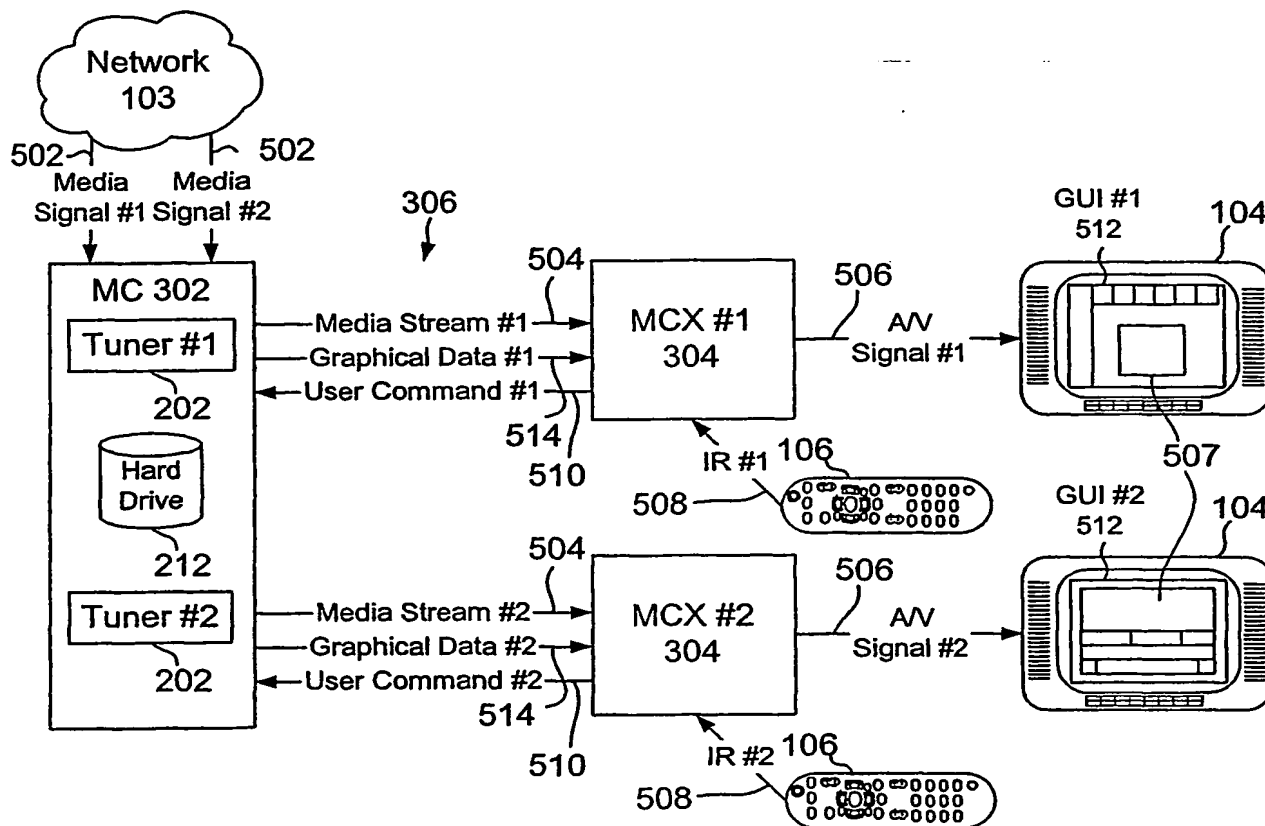


FIG. 5

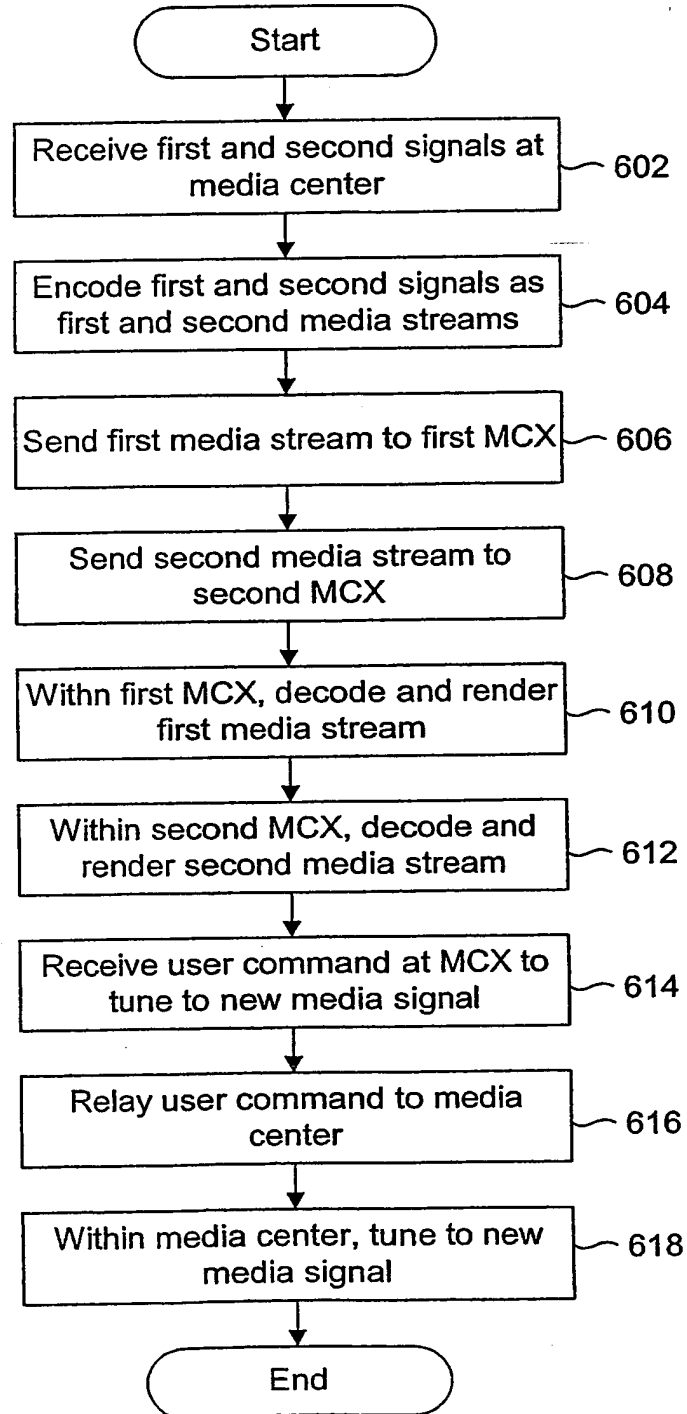
600

FIG. 6



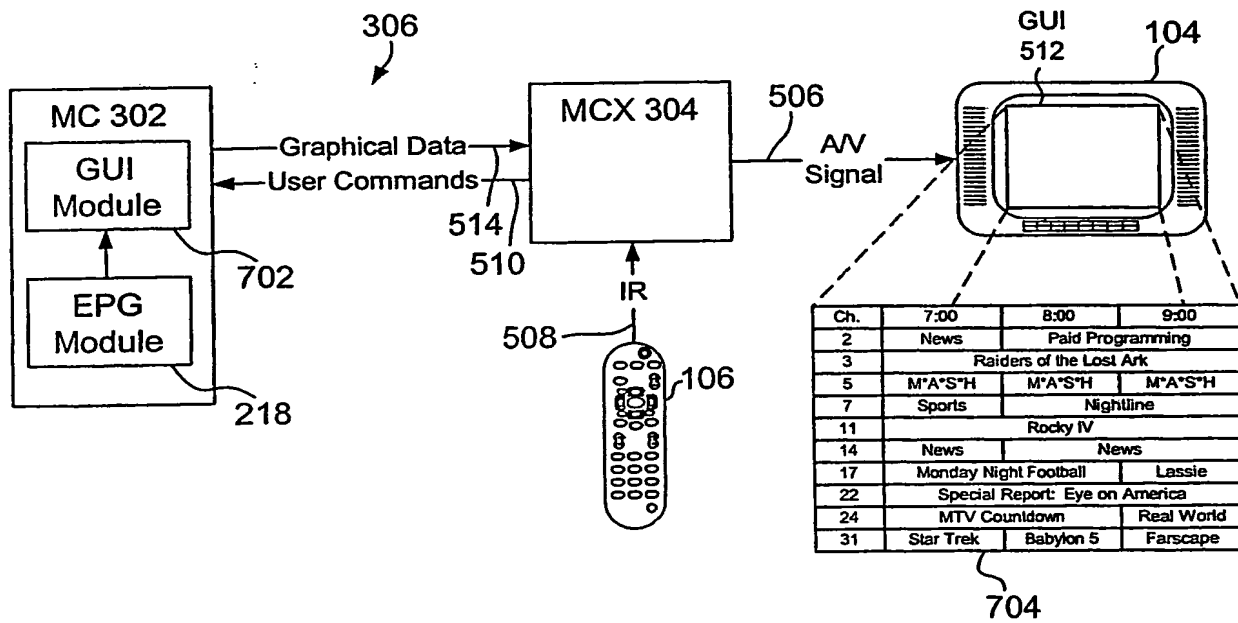


FIG. 7

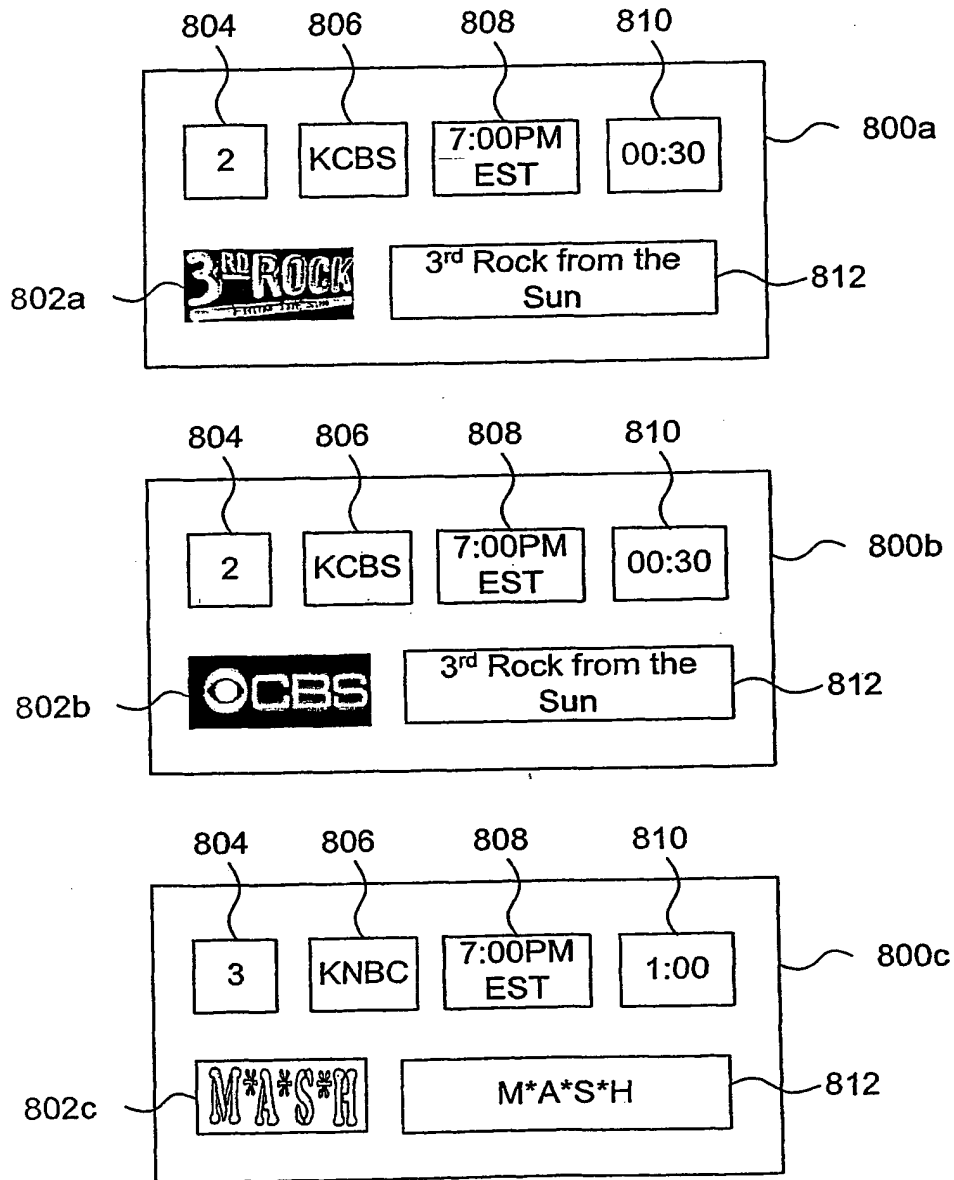


FIG. 8

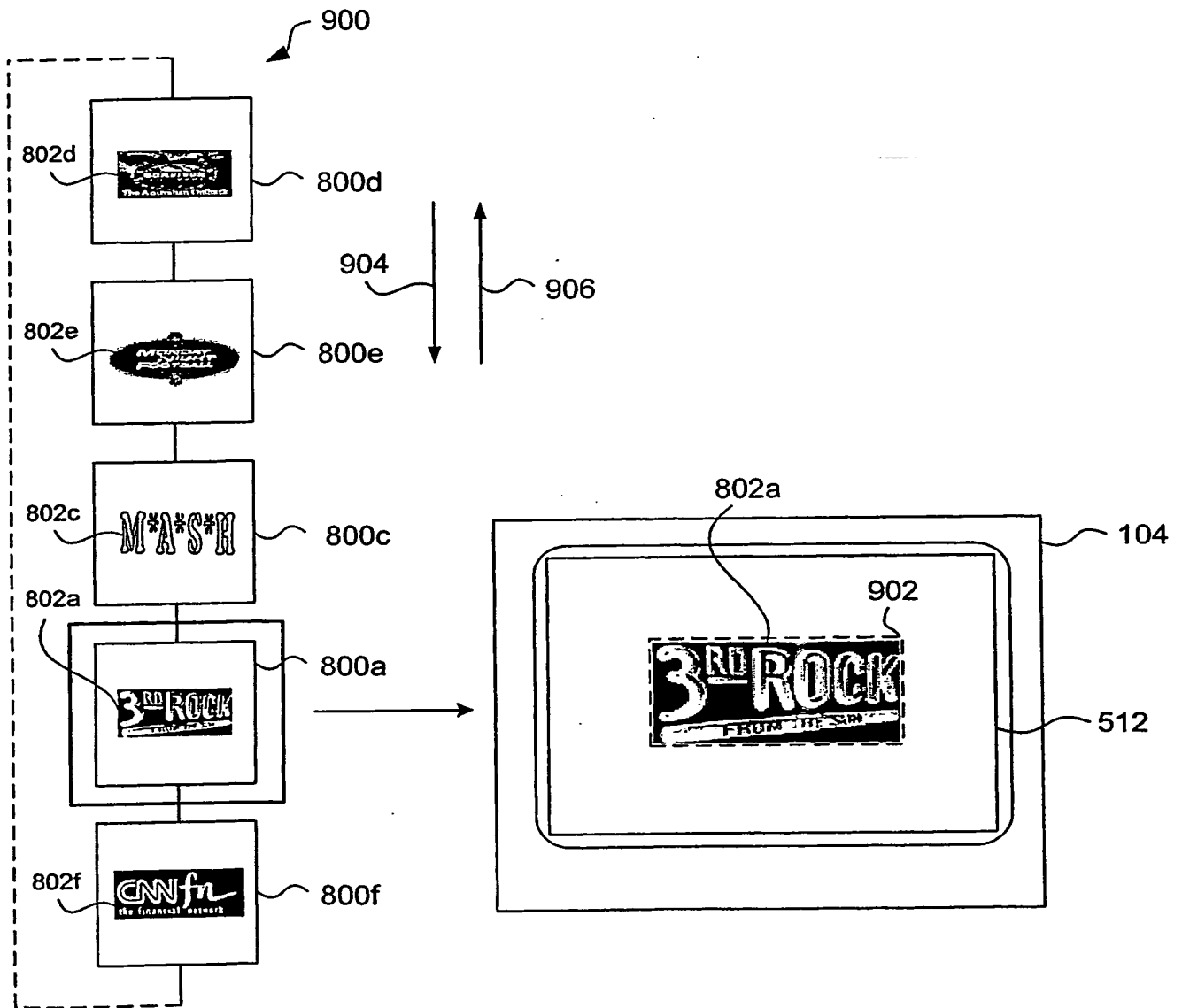
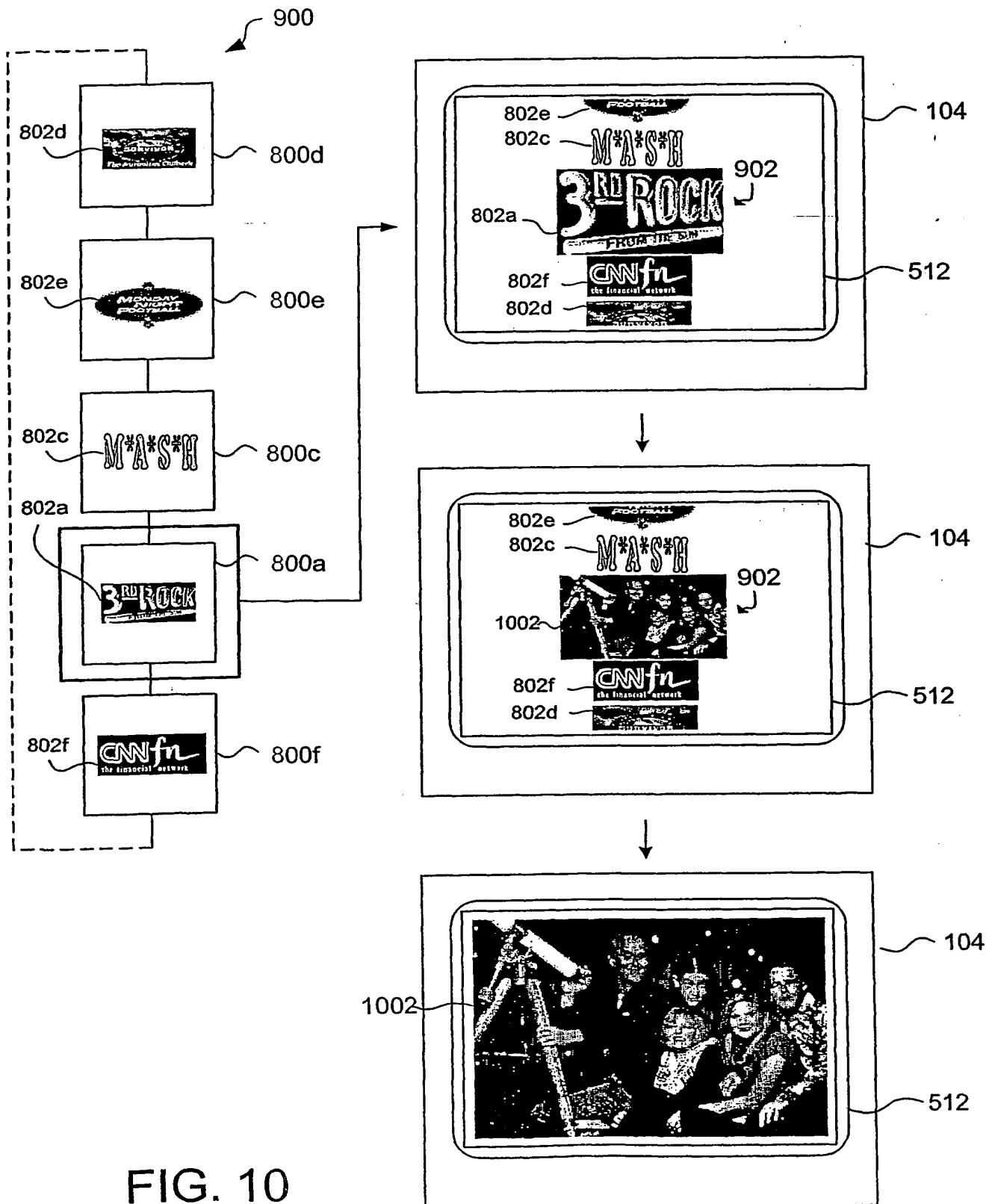


FIG. 9



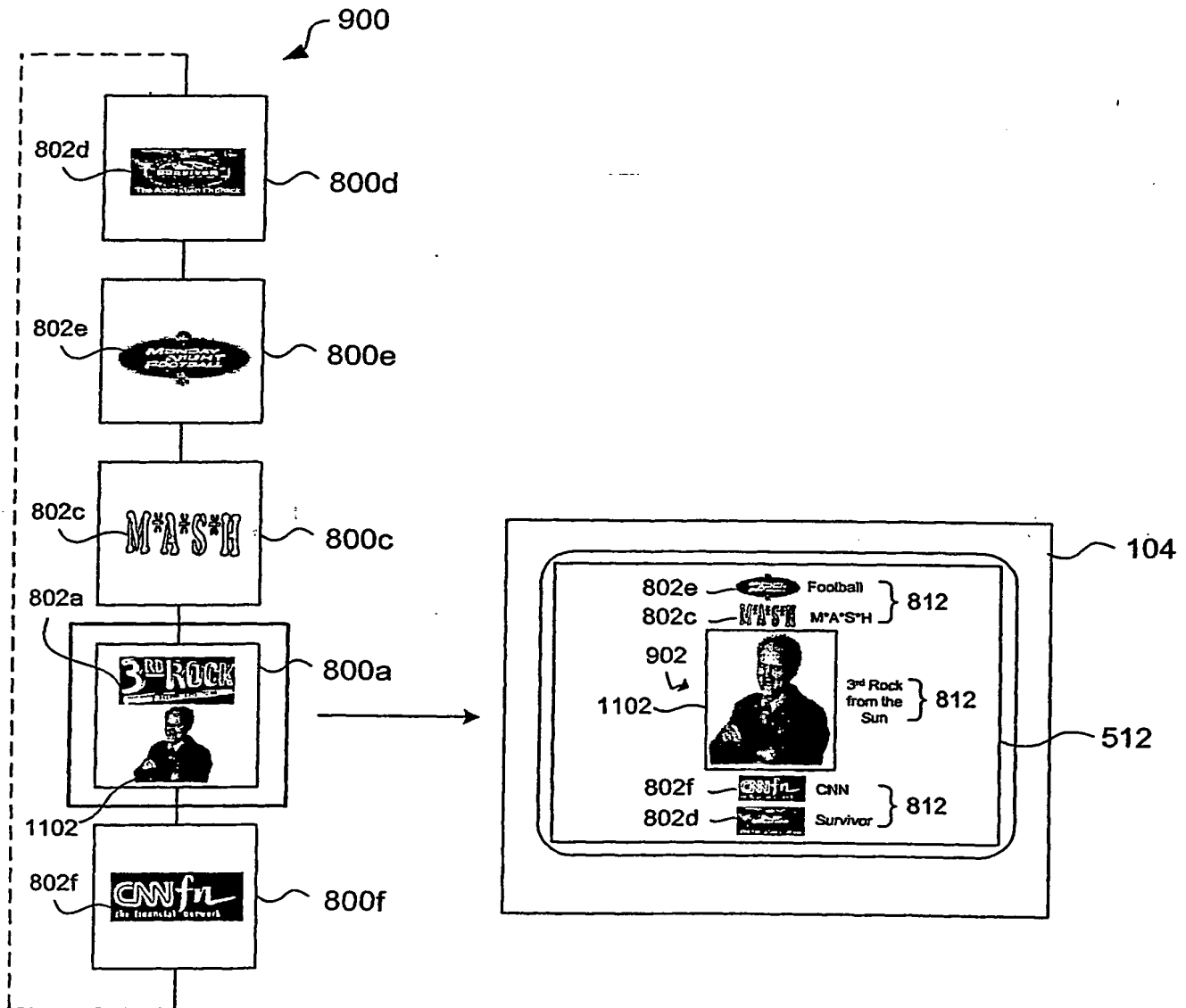


FIG. 11

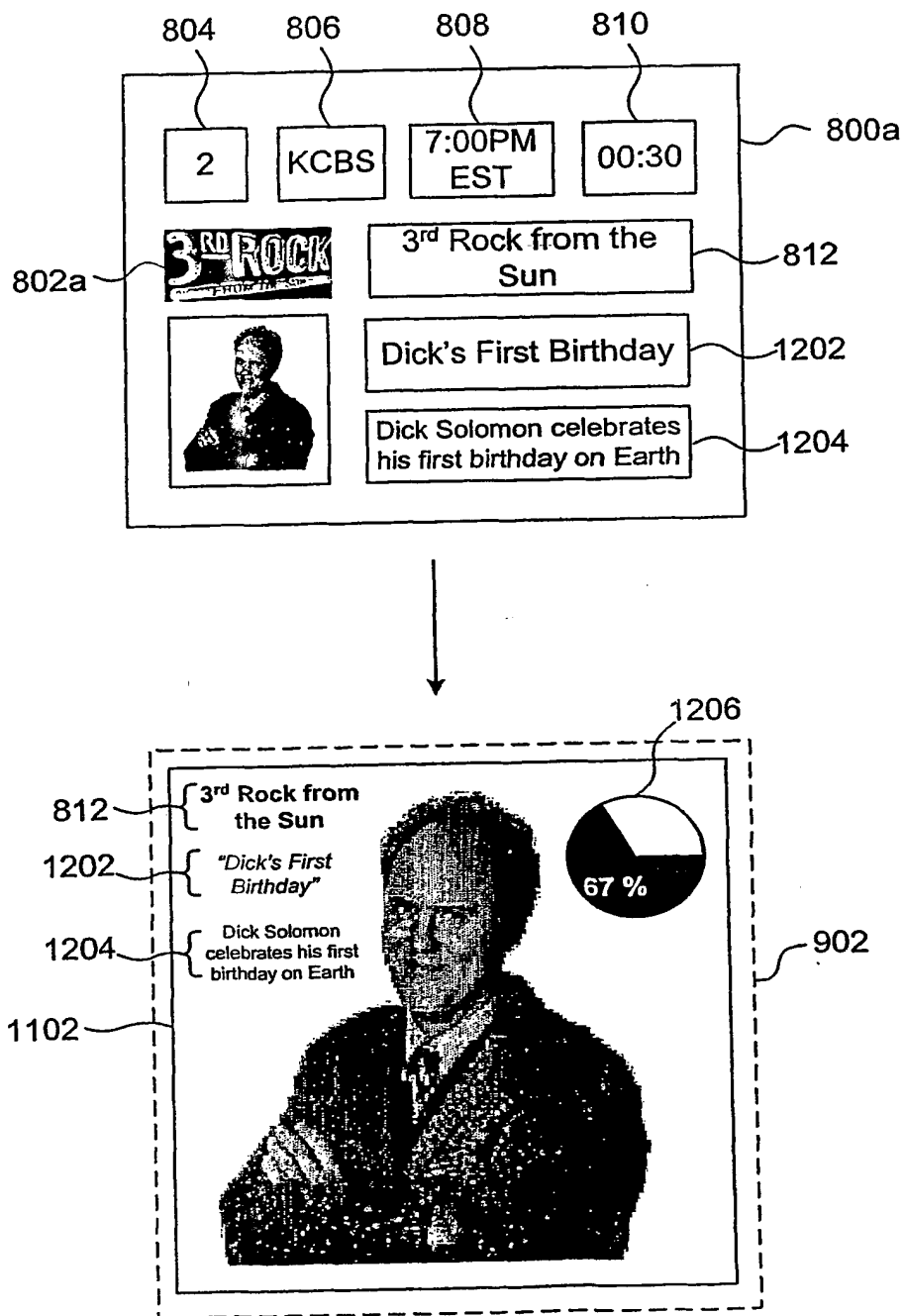


FIG. 12

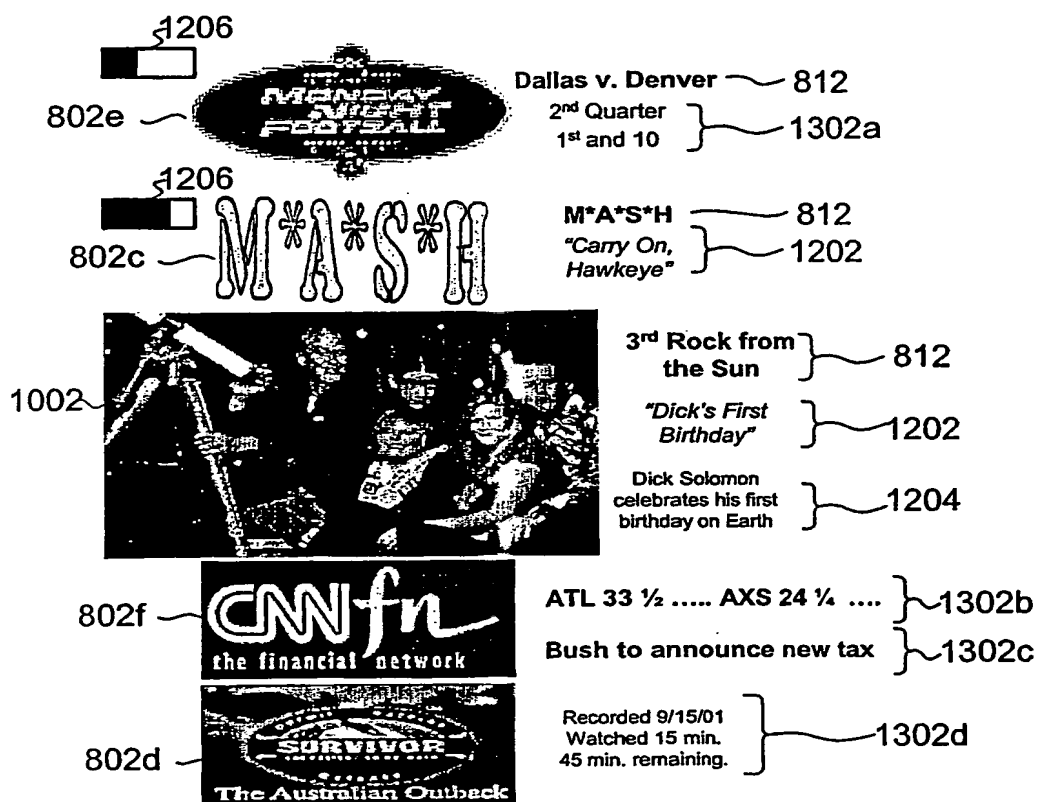
512

FIG. 13

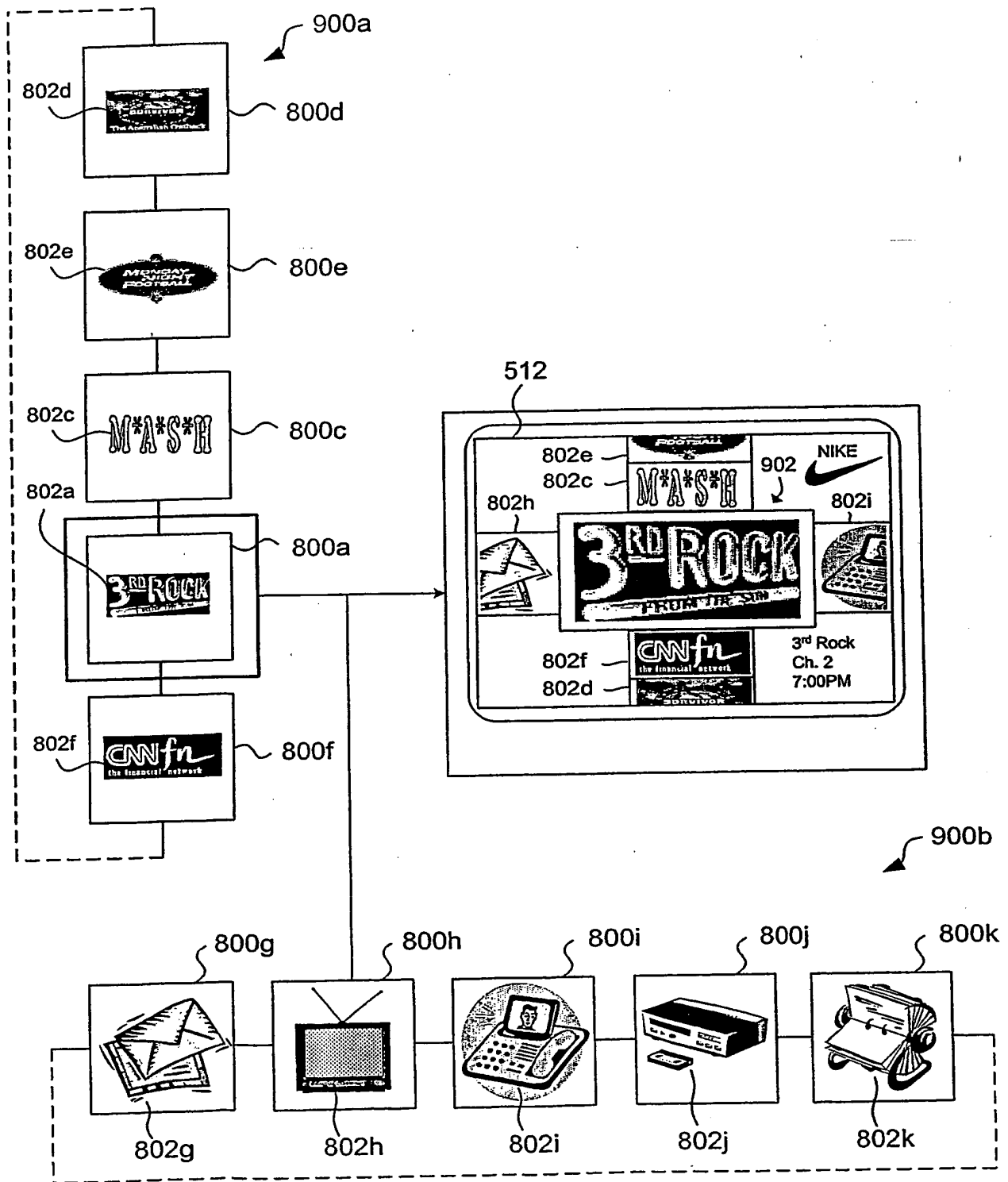


FIG. 14



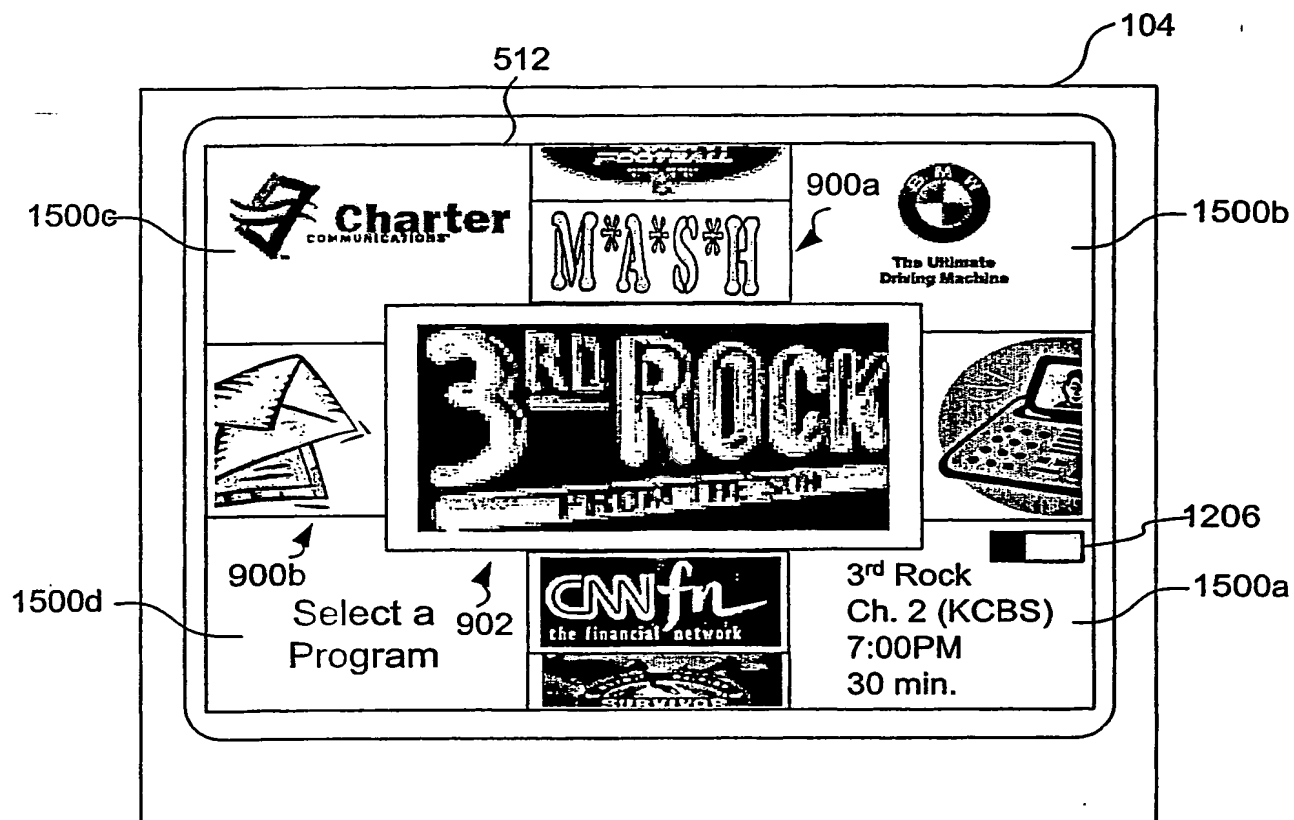


FIG. 15

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VN, YU, ZA, ZM, ZW.

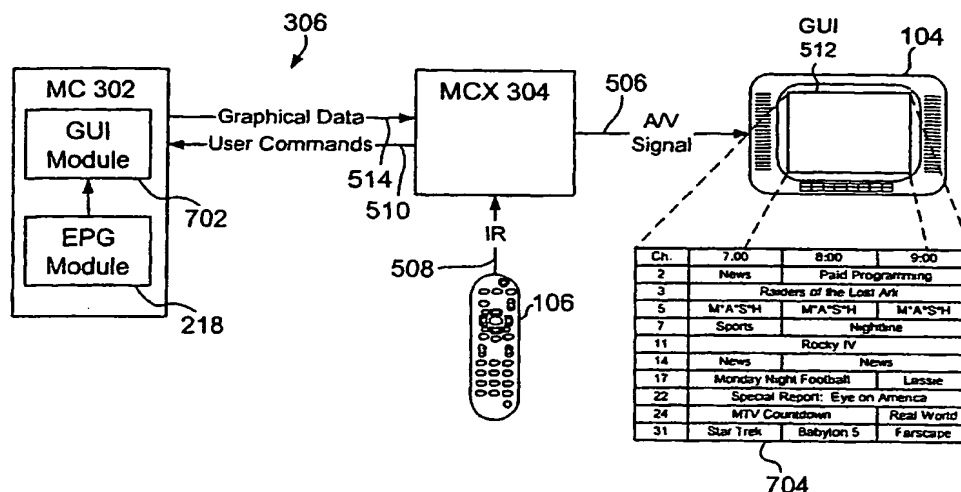
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[Continued on next page]

(54) Title: FOCUSED NAVIGATION INTERFACE FOR A HOME MEDIA CENTER WITH MULTIPLE TELEVISION SUPPORT



(57) Abstract: Within a media center (302), a user interface module (702) generates graphical data (514) representing a user interface (512). A network interface (406) sends the graphical data (514) via a home network (306) to a media center extension (304), where a display interface (206) renders the graphical data (514) into the user interface (512) on a television (104). In one configuration, the user interface (512) includes a focus area (902) intersected by a first axis, as well as a first sequence (900) of cards (800) displayed along the first axis, each card (800) graphically representing an available option, one card (800) being displayable within the focus area (902). The first sequence (900) of cards (800) is to be scrolled along the first axis in response to an initiating action to progressively change the card (800) within the focus area (902). Furthermore, the scrolling of cards (800) is to be halted in response to a terminating action to show a selected card (800) from the first sequence (900) within the focus area (902).

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/05931

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**B. FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

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Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 6,289,169 B (OKUYAMA et al.) 11 September 2001; Fig. 1,3 & 8; Col. 4, lines 5-Col. 5, lines 65 and Col. 11, lines 20-65+;	1-4, 7, 19-24, 26-27, 39-42
Y	US 6,028,600 A (ROSIN et al.) 22 February 2000; Abstract; Fig. 8-9; Col. 9, lines 35-Col. 12, lines 18.	5-6, 8-18, 28-38 8-13, 15-18, 28-33, 35-38
Y	US 6,266,098 B1 (COVE et al.) 24 July 2001; Fig. 2, 5 & 9	8-13, 15-18, 28-33, 35-38
E	US 6,378,000 B1 (AKATSU et al.) 23 April 2002; Fig. 6	1, 20-21, 39, 41-42
A	US 6,198,479 B1 (HUMPLEMAN et al.) 06 March 2001; Whole Document	1-42

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